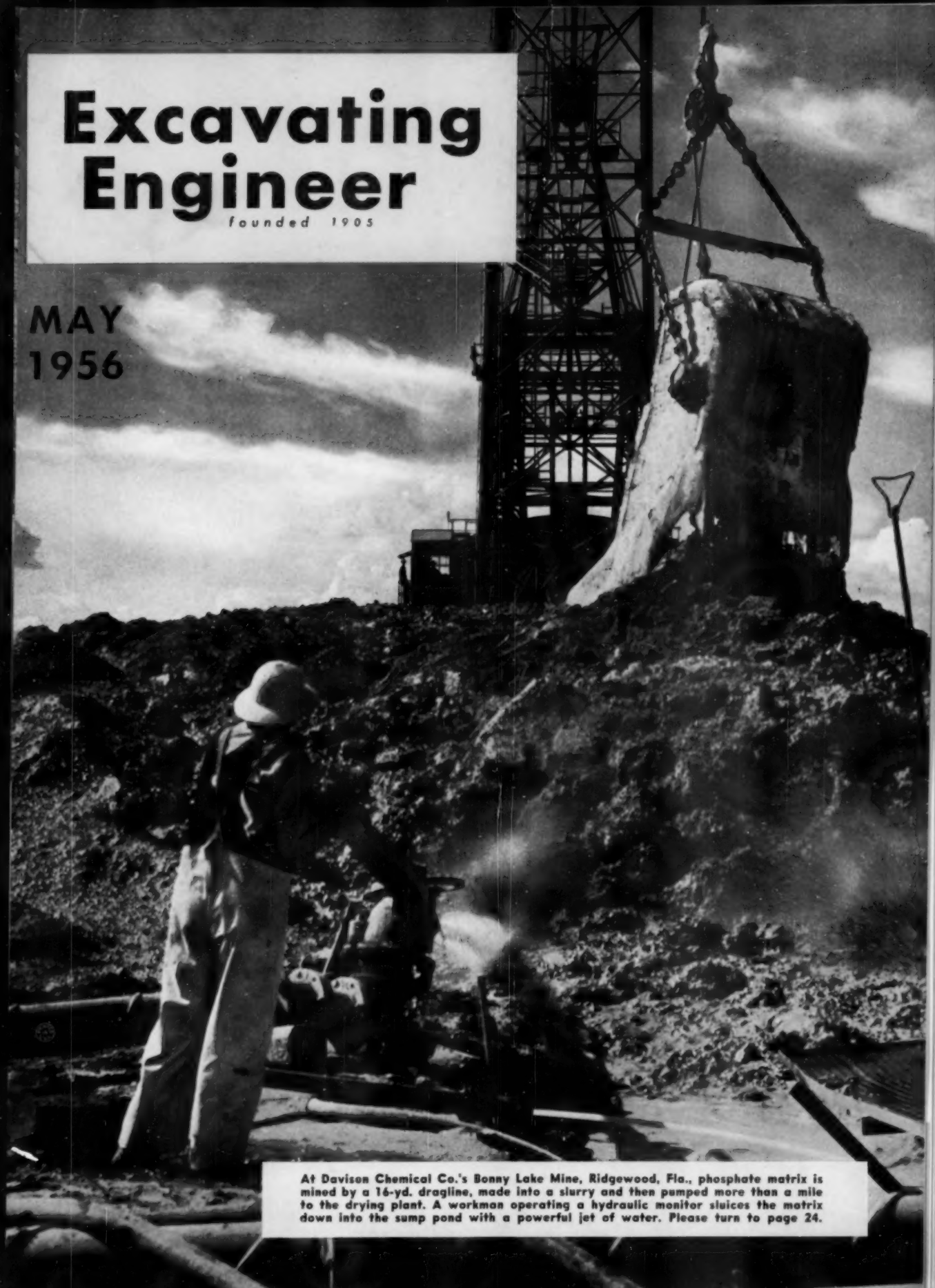
Excavating Engineer

founded 1905

MAY
1956



At Davison Chemical Co.'s Bonny Lake Mine, Ridgewood, Fla., phosphate matrix is mined by a 16-yd. dragline, made into a slurry and then pumped more than a mile to the drying plant. A workman operating a hydraulic monitor sluices the matrix down into the sump pond with a powerful jet of water. Please turn to page 24.

How a Reputation Was Earned for Low Upkeep and Big Output

ONE reason why Bucyrus-Erie excavators are so popular is their reputation for low maintenance. It's a reputation that's been earned with advantages like these —

Bucyrus-Erie's Individual Design for each model in its line matches every component to rated capacity — machines are never stretched to create a new model. There are few wearing parts, deadweight is reduced — you get maximum digging ability per pound of weight.

There's *quality-control* of every manufacturing detail. Each steel shipment undergoes mechanical, chemical, and metallurgical tests . . . is microphotographed for close analysis. With foundry facilities unsurpassed in the industry and an extensive, modern welding shop, Bucyrus-Erie pours its own castings and makes its own weldments. Thorough control is maintained over both manufacturing processes to insure the high quality that means top performance over years of profitable service.

These are some of the factors that contribute not only to minimum maintenance, but also to big output at low cost . . . and extra years of service. See your Bucyrus-Erie distributor soon for details on machines from 3/8- to 4-cu. yd.

203E56C

SOUTH MILWAUKEE BUCYRUS ERIE WISCONSIN

IMPOSSIBLE WITHOUT EXPLOSIVES

The modern highway—wide and spacious with increased visibility and no cross traffic—is a tribute to modern construction techniques. The above section of U.S. 99 between Bakersfield and Los Angeles, California, is a good example of engineering know-how. Where rock was encountered, blasting crews with Hercules explosives took over.

For more than forty years, Hercules has engaged in continuous research into the development of explosives materials and improved blasting techniques. Whether your requirements are for construction, mining, quarrying, seismic prospecting, or in other fields where explosives are needed, Hercules technical representatives will be glad to assist in the selection of the right materials for the most efficient job.

HERCULES POWDER COMPANY

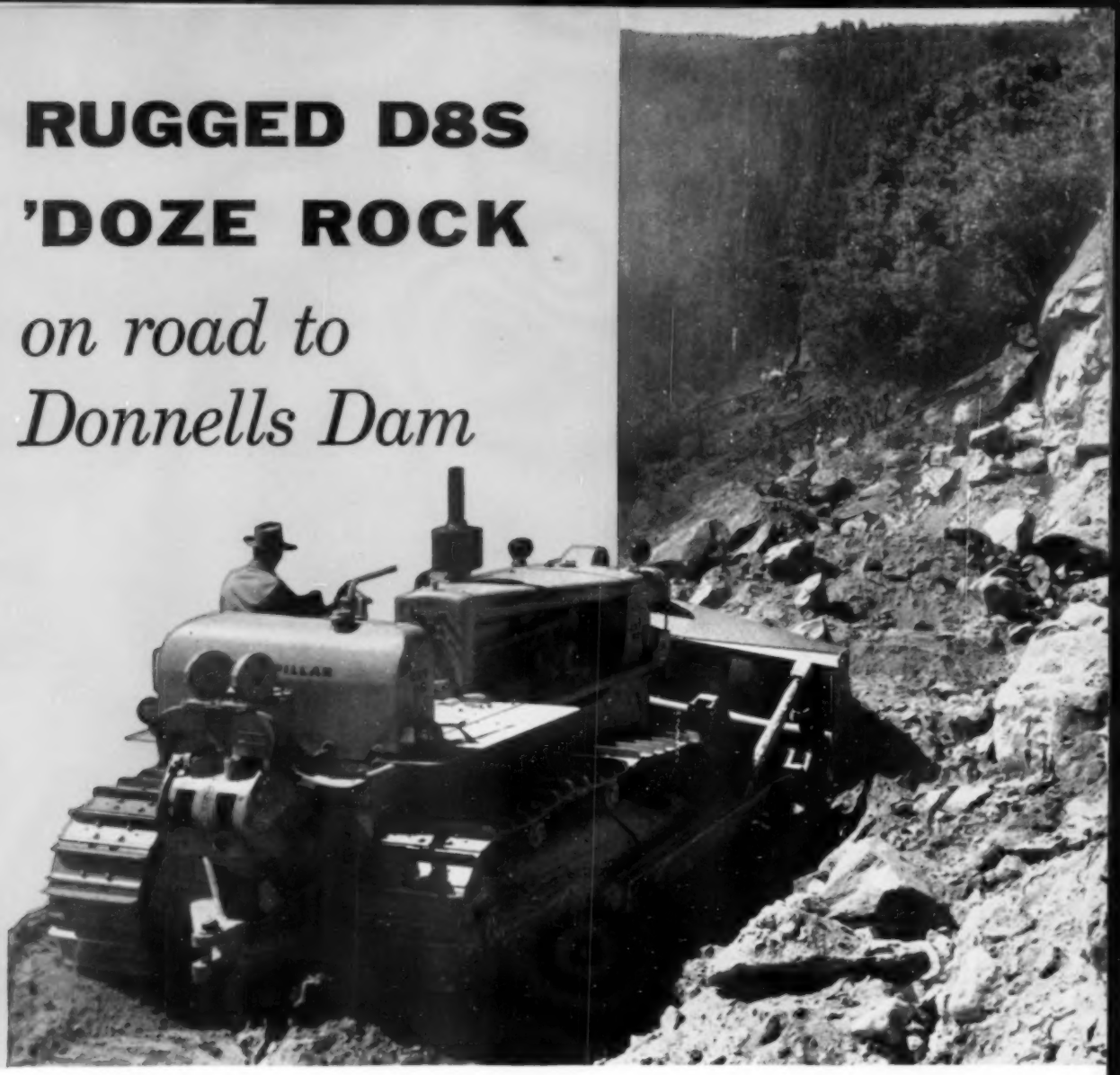
Explosives Department, 972 King Street, Wilmington 99, Del.

Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.; Joplin, Mo.; Los Angeles, Calif.; New York, N. Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Calif.

XR56-2

RUGGED D8S 'DOZE ROCK

on road to Donnells Dam



In rough mountain country above Strawberry, California, Tri-Dam Constructors are preparing for the $32,000,000 job of building Donnells Dam.

One of the first requirements is an 8-mile, 24-foot contour road leading up to the dam site and permanent camp. And most of the roadway has to be blasted out of steep granite slopes like the one pictured. Handling shot rock on locations like this takes tough equipment. That's why Tri-Dam is using CAT* D8 Tractors with No. 8S Bulldozers. There are 9 of them working on the project.

The D8 has been known as "king of the crawlers" for years. As jobs grew bigger and tougher, the tractor has grown with them. Today's D8 is new from the ground up—bigger, tougher, more powerful than any earlier model. Look at these features:

- *New heavy-duty 4-cycle diesel engine delivering 191 HP at 1200 RPM.*
- *Choice of torque converter or direct drive.*
- *Oil clutch, for smooth performance and long work life.*
- *New 7-roller track frame and long-wearing "water quenched" track shoes.*
- *New, more powerful starting engine with "in-seat" starting.*
- *Better job visibility and greater operator comfort.*

Your Caterpillar Dealer will be glad to show you how this new D8 can increase your production. And you can depend on him for prompt service and original parts. Ask him for a demonstration today.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

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Excavating Engineer

founded 1905

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An important source of gypsum for the Southwest's booming construction industry is located in the middle of a vast lonely desert country near one of the most unlikely cities in the world.

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110-mile Northeastern Extension will run from Plymouth Meeting north to Scranton. Badgett Mine Stripping Corp. has tough rock job in 7.3-mile contract, including one cut of a million yards.

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Perforated

Solid

HENDRIX Dragline Buckets

A TYPE FOR EVERY DIGGING PURPOSE
¼ to 40 Cubic Yards

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

Hendrix Lightweight Dragline Buckets

We made 'em TOUGH then... but they're TOUGHER today!

THE two pictures of Northwest Pullshovels on this page were made within a few weeks of each other. Take a look at the digging these machines are in.

The picture at the top shows a venerable Northwest Model 4 that has recently had its 27th birthday. It is shown laying bituminous coated pipe through rock on a sewer job at Bedford, Indiana.

The picture to the left, shows a Northwest Model 25 that is just a year-old youngster.

You can handle a lot of jobs with light equipment but what do you do when you're up against digging like this? The fact that you can take a 27-year old rig, built when no one thought of putting a pullshovel in rock, and get output in digging like this, illustrates what Northwest Plus Production means, better than anything.

We built 'em tough *then*, but we build 'em *tougher* today. Today as always they are built for the tough work and they bring you all the stamina that the best in modern engineering and design can bring. If you are planning on new Shovel, Crane, Dragline or Pullshovel equipment, talk it over with a Northwest man.

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Chicago 3, Illinois

P25-2-LC

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NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

S-18 "EUC" SCRAPER

This new Euclid S-18 incorporates all of the advanced design features that have made "Euc" Scrapers the fastest growing line in the industry. With hydraulic lever action providing positive, independent control of bowl, apron and ejector, expense and down time for cable replacement is eliminated. Torqmatic Drive, NoSpin differential and rugged construction make the S-18 suitable for the toughest jobs and work with big pusher tractors. The low, wide scraper bowl, with adjustable 4-section cutting blade, assures efficient loading in any material. All major components are readily accessible . . . a feature that really pays off in more work-ability and low maintenance cost . . . one of the reasons why *Euclids are your best investment.*

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Maneuverability is exceptional in spite of the size and capacity of the S-18. The full hydraulic power steering and good hitch design permit non-stop turns in only 36'. Here an S-18 makes a quick turn after spreading its load on a highway relocation job in Wisconsin.

The tremendous power of the S-18 with independent control of all scraper operations and the low, wide bowl provided fast loading in the loose sand of this Wisconsin airport job. Euclid's four section cutting blade, with each section adjustable, reversible and identical, cuts maintenance cost and assures the most efficient loading in any material.

High apron lift and independent control of all scraper operations facilitates dumping big loads. On this air base grading work in Kansas, the fast dumping, traction and speed of the S-18 enabled the contractor to maintain high production at low cost. Short overhang of the engine gives better stability in rough going.

Better Accessibility means More Work-ability

HAS THE VERSATILITY NEEDED FOR ALL KINDS OF JOBS

SURE, SMOOTH POWER & TRACTION

300 h.p. engine . . . Torqmatic Drive . . . 27.00 x 33 tires with 33.5 x 33 optional . . . 18 yds. struck capacity . . . 21 yds. heaped at 3:1 slope and 25 yds. at 1:1 . . . NoSpin differential . . . full hydraulic steering . . . non-stop 180° turns in only 36 feet . . . hydraulically controlled lever action of bowl, apron and ejector . . . four section reversible cutting blade . . . built to work with the biggest pusher tractors on the toughest jobs.

Coming and going the S-18 cuts cycle time. The Torqmatic Drive and 300 h.p. engine permit shifting under full engine power—provide power and speed to move big loads fast. On this North Carolina highway job top extensions were used to increase bowl capacity—loads of 25 yds. and more were moved from borrow pit to fill at high speed.

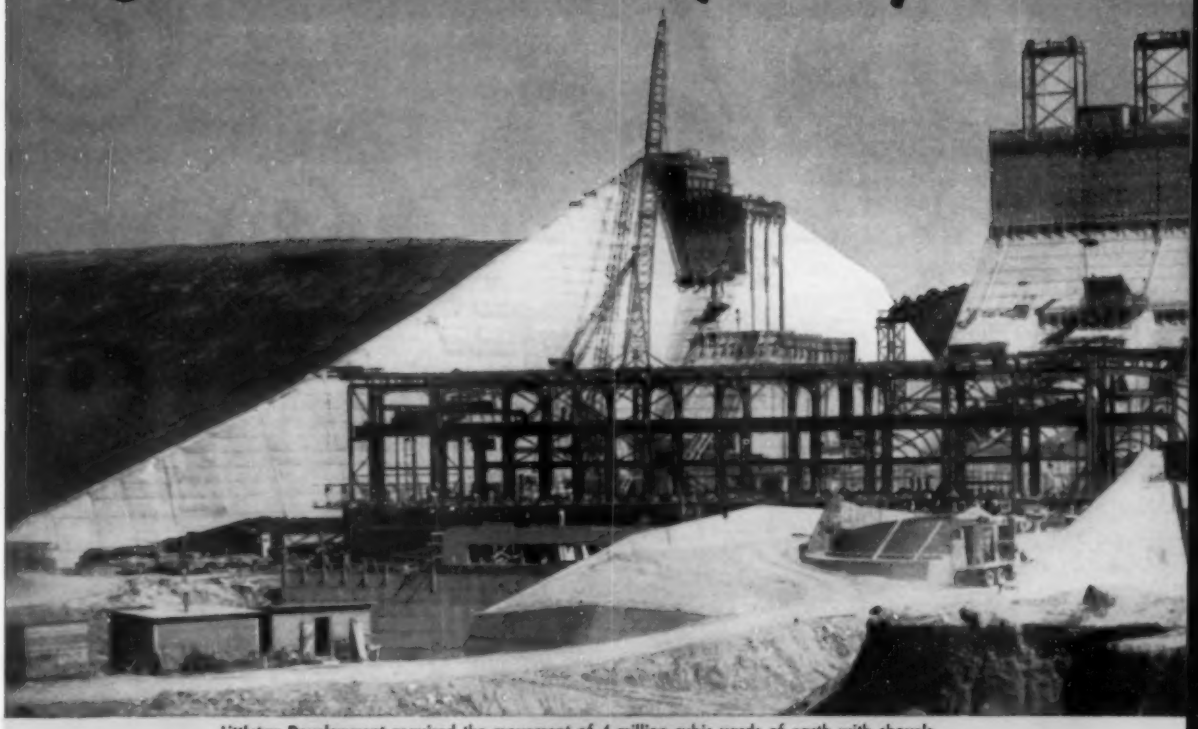
Grading this plant site on the Tennessee River proved the outstanding performance of the S-18 in difficult material. Heaped loads of heavy clay were picked up, hauled and spread in a hurry. The 300 h.p. engine, big tires, Torqmatic Drive and NoSpin differential pay off in better traction, flotation and work-ability.

***COMPARE** the cost-cutting features of "Euc" Scrapers with your present equipment. Your Euclid dealer will be glad to supply information on the complete line—from 7 to 18 yd. struck capacities.*

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

Tiger Brand Wire Rope helps build



Littleton Development required the movement of 4 million cubic yards of earth with shovels and scrapers which used a considerable amount of Tiger Brand Wire Rope in the process.

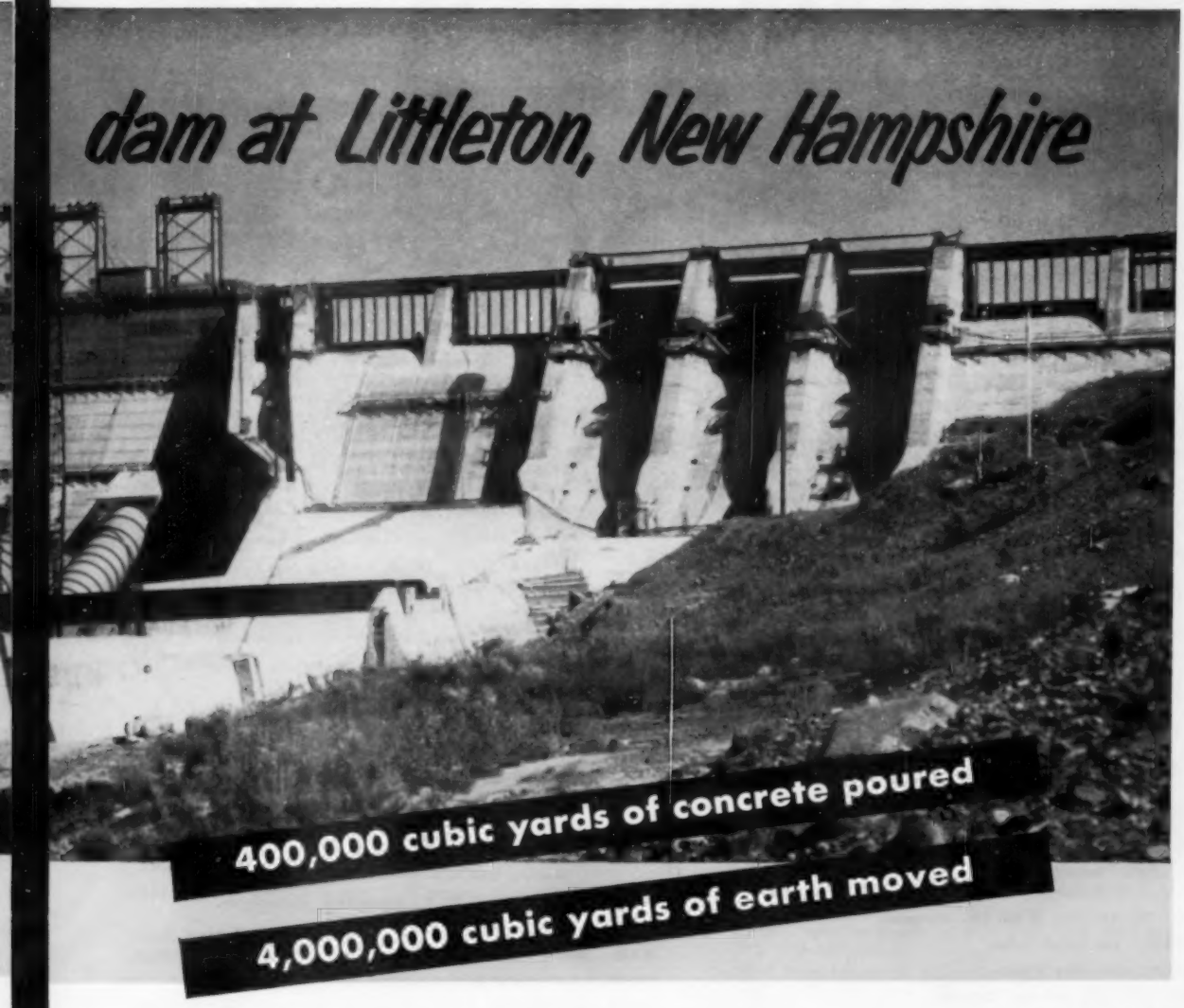
Tiger Brand Wire Rope does the work quickly and at low cost. Hoist ropes are built with the best combination of strength, flexibility and abrasion resistance to assure long life.

Facts about the Littleton Development

Built by the New England Electric System as part of the Connecticut River Power Company Development.

Engineers: Ebasco Service, Inc., New York City, designers of dam and powerhouse and supervisors of construction of both. *Contractor for preparing site, building diversion channel and earth dam:* B. Perini & Sons Company, Farmingham, Mass. *Contractor for the concrete work:* Morrison-Knudsen Company, Boise, Idaho.

Pouring 400,000 cubic yards of concrete means the crane's hoist ropes take a lot of punishment. Standard Tiger Brand Rope was used in this operation.



The new "Samuel C. Moore Station" of the New England Electric System shares honors with Camerford as the two largest hydro stations in New England.

The rating of the station will be 150,000 kilowatts. The height of the dam is approximately 165 feet. The size of the lake impounded is the largest on the Connecticut River, 11 miles long and covering 3500 acres.

To build this dam, the contractors had to move approximately 4,000,000 cubic yards of earth and pour about 400,000 cubic yards of concrete. The concrete was hauled about a mile to the job in 4-cubic-yard buckets. These were hoisted from the truck to the position on the dam by cranes and the concrete was dumped into the forms.

The contractor for the concrete work was Morrison-Knudsen Company, Boise, Idaho, and the contractor for preparing the site, building diversion channel and earth dam was B. Perini & Sons, Framingham, Mass.

Both contractors used large quantities of American Tiger Brand Wire Rope. It is interesting to note that all the wire rope needs for this job could be supplied from the standard types of Tiger Brand Rope.

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USS AMERICAN TIGER BRAND WIRE ROPE

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Stripping Shovels

Water Well Drills

Crawler Cranes

Quarry & Mine Excavators

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General Purpose Excavators and Cranes — ⅜ to 4 cubic yards (0.28 to 3.1 cubic meters) capacity.

Hydrocranes — 4-ton crane (3.6 metric ton); ⅜ cubic yard excavator (0.28 cubic meters). 9-ton crane (8.2 metric ton); ½ cubic yard excavator (0.38 cubic meters).

Quarry and Mine Shovels and Draglines — 2½ to 8 cubic yards (2 to 6 cubic meters) capacity.

Stripping Shovels — 2 to 65 cubic yards (1.5 to 49.7 cubic meters) capacity.

Blast Hole Drills (Cable Tool) for 6, 6⅝, 9, and 12 inch (150, 170, 230, and 305 millimeter) holes.

Blast Hole Drills (Rotary) for 6¾ to 9-in. holes (170 to 230 millimeters); for 9⅞ to 12¼-in. (250 to 310 millimeter) holes.

Walking Draglines — 4 to 33 cubic yards (3.1 to 25.2 cubic meters) capacity.

Railway Cranes — 160 and 250 ton (145 and 227 metric ton) capacity.

Water Well Drills for depths of 500, 1000, and 1500 feet (150, 305, and 455 meters).

Oil Well Drills for depths of 1500, 2500, 3500, and 6000 feet (455, 760, 1070, and 1830 meters).

65Y56C

BUCYRUS ERIE

RUSTON — BUCYRUS

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin, U.S.A.

and

RUSTON-BUCYRUS, LIMITED
Lincoln, England

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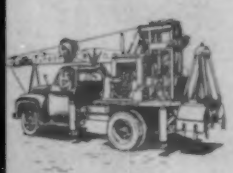
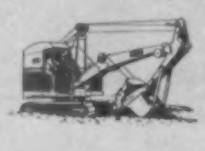
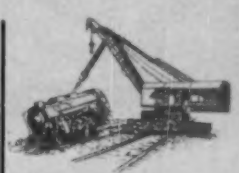
World's Largest Manufacturer of Excavators and Cranes



Hydrocranes



General Purpose Excavators



Railway Cranes

Blast Hole Drills

Walking Draglines

CHICAGO

the most IMPORTANT PLACE for the Construction Industry in 1957

A.R.B.A. ROAD SHOW and CONVENTION,

International Amphitheatre, Jan. 28 to Feb. 2, 1957

Here in Chicago everything is being done to make the coming A.R.B.A. Road Show and Convention an event that will be remembered for its value as an instructive conference, a helpful equipment show and its pleasures. Chicago's vast hotel setup is being organized to care for the large attendance that will be present. The International Amphitheatre is the largest exhibit hall in the Country and will provide an ideal spot for gathering and viewing the over 1,000 pieces of equipment that will be shown.

The Stock Yards Inn with its many eating places and cocktail lounges, and the cafeterias in the Amphitheatre, assure comfortable restaurant facilities.

Free Bus Service from the main hotels will assure adequate transportation and permit attending convention sessions regularly and at the same time allow you to spend time at the show.

Add to all this the many attractions that Chicago always provides.

Remember the place—the date—and make your plans. Ask to be put on the list to receive future information on the 1957 Road Show and Convention.

AMERICAN ROAD BUILDERS' ASSOCIATION

World Center Building Washington 6, D.C.

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA · AMERICAN ROAD BUILDERS' ASSN. ARBA 1902

"Never lets me down"

says Everett Datton, San Antonio, Texas, about the Allis-Chalmers Model D Motor Grader.

It's two homes a day, out Texas way—as Quincy Lee Construction Company works on a big-scale project of building 1400 new homes in two years.

One of the machines on the job is an Allis-Chalmers Model D motor grader used to grade roads, landscape homes and build driveways. Owner Quincy Lee says this about his Model D: "I'm very happy with it. It does a very fine job for us." Operator Everett Datton says,

"I like the Model D. It gets in and out of tight spots, especially where buildings are close together. With the D's fine control I can work between newly-planted trees and close to sidewalks without damaging trees or chipping cement. Not only is this machine good at fine grading, but its diesel engine has plenty of power for handling full capacity loads. I run it 9 hours a day, 5½ days a week. *She never lets me down.*"

• • •

Quincy Lee and Everett Datton are confirming what thousands of other Model D operators and owners know. In its class, you just can't beat the D for sure-fire performance at low cost. Watch it in action and you'll be amazed how the D's right combination of weight, power and traction lets it handle a wide range of jobs. And you can choose either diesel or gasoline engine models, plus number of attachments—including rear-mounted ⅜-yd loader and midship-mounted hydraulic scarifier, to increase the Model D's usefulness and efficiency.

See the Model D now at your Allis-Chalmers construction machinery dealer—headquarters for factory-trained servicemen, factory-approved facilities and True Original Parts.

Model D
50 belt hp diesel or gasoline engine

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

1105...YES, ELEVEN-O-FIVE

is the new-strength wire in Roebling's

Royal Blue

WIRE 1105 ROPE

AS SIZES and constructions go, Royal Blue is like the ropes you have used until now... but the likeness ends there.

Royal Blue is made of Roebling's new 1105 wire, the strongest, toughest wire developed up to now for use in any wire rope.

Royal Blue Wire Rope is as enduring as the wire from which it is made.

Write us for full facts on Royal Blue Wire Rope, or contact your Roebling distributor.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.

THE JOB: straighten a road, build bridge approaches **AND MOVE A RIVER!**

This CAT* No. 12 Motor Grader is helping cut out a new channel for the Iowa River near Marshalltown.

It's part of a project which called for straightening curves in a county road, building approaches to a bridge, and diverting a meandering river beneath its new span. The length of road involved was only 0.8 of a mile, but Mickle and Ross Construction Co., of Newton, Iowa, moved nearly 100,000 cu. yd. of dirt.

Foreman Virgil E. Reynolds had a fleet of 11 Caterpillar machines on the job. "We don't have an off-breed in the outfit," he said.

Working close to water like this is tough going. The No. 12 had to maneuver in mushy, sandy loam. "Occasionally machines hit silt pockets and nearly dropped out of sight," Supt. Reynolds said, "but I never worry when I've got the right equipment... and I've got the right equipment."

The No. 12 is "the right equipment" for contractors all over the country—for four big reasons. Costs less to maintain. Costs less to operate. Produces more. Lasts longer.

Your dealer would like a chance to back up each one of these claims with specific details. The exclusive Caterpillar oil clutch, for instance, that gives up to 1500 hours' service without adjustment. And the new tubeless tires (now standard equipment) that can eliminate 80% of the down time caused by tires.

Let your Caterpillar Dealer demonstrate the dozens of other features that make the No. 12 the high-producing, cost-cutting motor grader it is.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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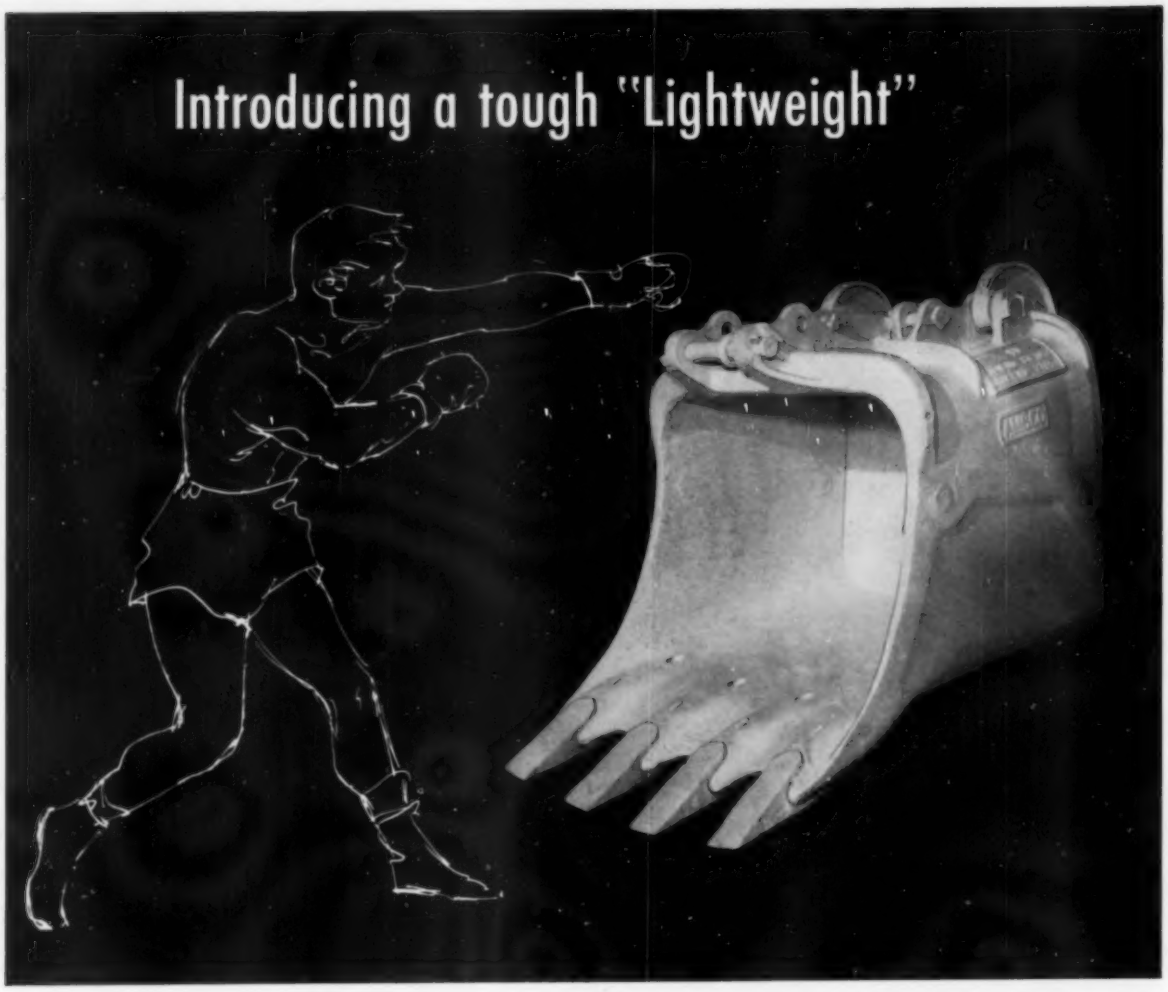
99% OF ALL CAT MOTOR GRADERS EVER BUILT ARE STILL ON THE JOB



NEW Amsco® Manganese Steel LIGHTWEIGHT DIPPER

Rugged 3/4 yd. dipper, made of the "toughest steel known," actually work-hardens under impact

Those big, tough Amsco Dippers now have a smaller brother. With this new, rugged, lightweight dipper, small shovel operators can enjoy the combined advantages of long-wearing manganese steel and proved Amsco design features, such as:

- One-piece manganese steel back castings
- Arch formed by complete box section for maximum strength
- Teeth are set for clean, fast digging
- Interior is designed for rapid dumping
- Lugs for handle, back, and braces are cast integral with back—for extra strength
- 25% lighter than standard Amsco 3/4 yd. dipper, permitting use on light-duty shovels and allowing their developed power to be more fully utilized
- Curved door in back, for full-capacity loading with each pass

Ask your shovel manufacturer for full information—or write us direct for descriptive literature.

"Vital Statistics" on this new lightweight champ

Height of front over teeth	4 ft. 5/8 in.
Height of back	2 ft. 7 in.
Opening at top	2 ft. 5 in.
Opening at bottom	2 ft. 7 in.
Approximate weight	1550 lbs.

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DELAWARE, OAKLAND, ST. LOUIS, JOLIETTE, QUEBEC

John A. Denie's Sons' ready-mix concrete plant, located at Memphis, Tennessee, showing part of their fleet of Macks, which now totals 60 and is still growing.

John A. Denie's Sons Company, Memphis, Tennessee, reports:

"To assure on-time service customers request delivery by MACKS"

Four years ago, the John A. Denie's Sons Company, one of the largest and oldest ready-mix concrete plants in the country, recognized their need for the most dependable, heavy-duty truck chassis available. Their problem was one of making ready-mix deliveries on time to almost inaccessible locations over extremely rough terrain. To solve it, Denie's tried just about every make of equipment. Finally, they purchased four Mack six-wheelers.

"Shortly after our Macks went into operation, customers started to call and request that their orders be delivered by Macks. They knew they could depend on them to make delivery on schedule, regardless of the rugged ground over which they had to travel. *Our records show that no Mack has ever failed to deliver a load on time,*" writes Mr. Forrest Ladd, Denie's executive vice president.

After noting the widespread customer satisfaction with their reliable service, and a thorough check of their operating costs, Denie's president, Mr. M. A. Moss began to increase their fleet of Macks. Today they have 60 Macks, and the number is still growing.

"Another interesting fact revealed by our operating reports," states Mr. H. O. Pommer, vice president in charge of operations, "is that Denie's has never had to replace an axle shaft, driveline, ring gear, pinion, brake drum, or reline any of the brakes on any of its Macks."

Denie's executives, like so many others, know from experience how well their investment in Macks has paid off for their company.

Let your Mack Branch or Distributor give you complete details . . . find out how Macks can improve your hauling operations. Mack Trucks, Empire State Building, New York 1, N. Y.

MACK
first name for
TRUCKS

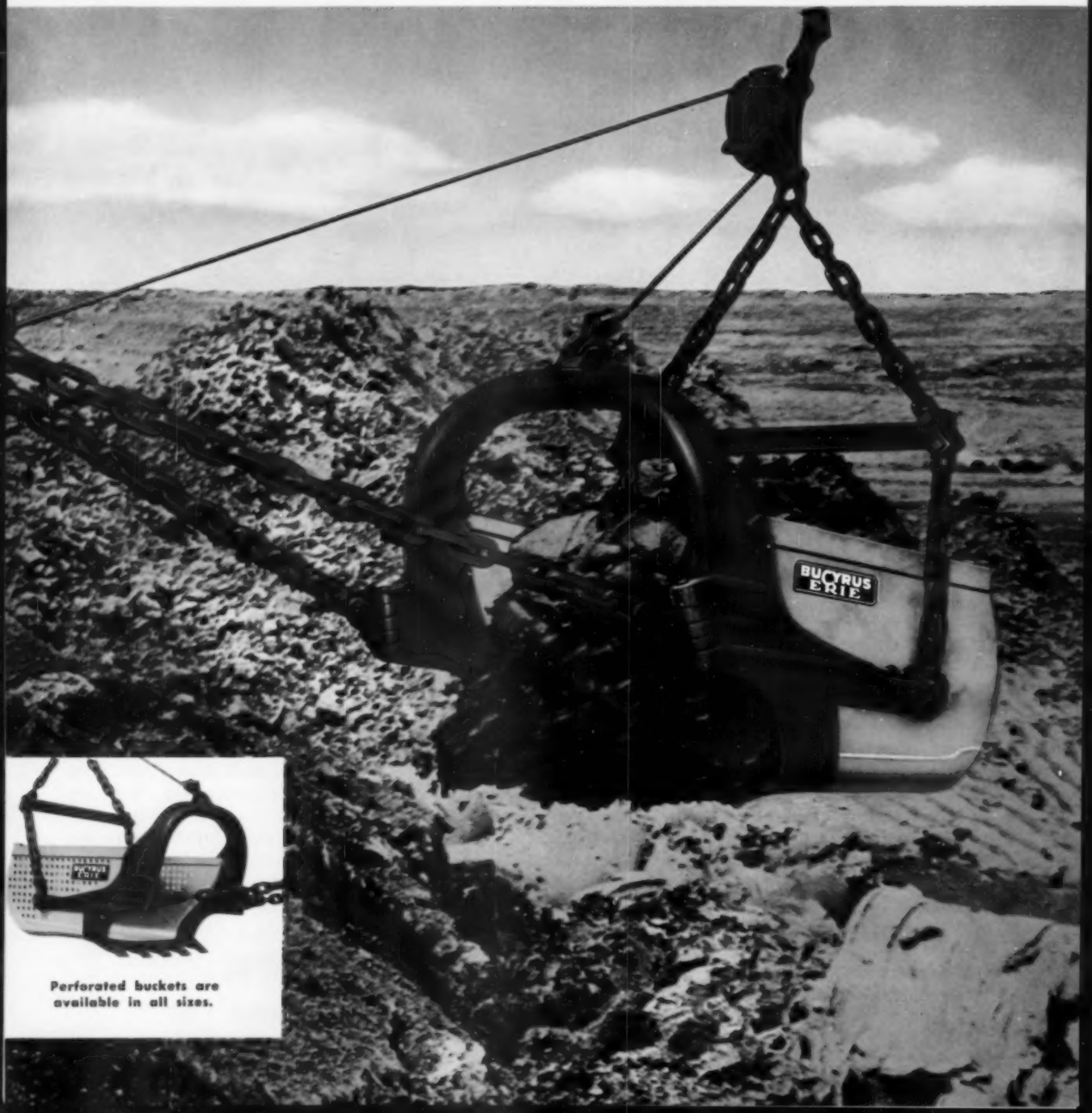
3916

BUCYRUS-ERIE ANNOUNCES

all new

DRAGLINE BUCKETS

Light, Medium, and Heavy-Duty Types



Perforated buckets are available in all sizes.

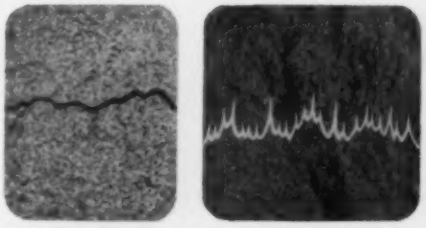
NEW DESIGN! NEW LIGHT WEIGHT! NEW HIGH OUTPUT!

A line of dragline buckets designed and built to set new high standards of performance — that's what Bucyrus-Erie now offers you. These new buckets include such high-production design features as:

1. "Slicing action" lip to penetrate material quickly and easily.
2. Tapered basket scientifically shaped to load full and fast.
3. Proper flaring and balance to minimize bobbing and spillage.
4. Smooth inside design and high arch for fast, clean dumping.

MADE OF BECOLOY FOR ADDED WEARING ABILITY

Bucyrus-Erie developed BECOLOY, a special steel alloy with a tough, fibrous structure, for these new dragline buckets. Its strength and metallurgical characteristics provide high impact resistance, even at low temperatures. It can be readily cut with an acetylene torch and welded rapidly with only moderate preheating — no special welding procedures are required.



BECOLOY fracture surface at right shows tough, fibrous structure that imparts high strength to this alloy. In contrast, ordinary steel fracture surface, at left, has a coarse, crystalline pattern.

HERE ARE STILL MORE FEATURES YOU'LL LIKE

- ☆ Strong tooth bases are made of BECOLOY, hold teeth properly to dig full clearance for bucket.
- ☆ Hardened BECOLOY teeth — solid or two-part — are easily replaced.
- ☆ Long clevis plates provide strong side-plate support.
- ☆ Strong, lightweight chains offer maximum strength and safety.
- ☆ Free-rolling dump block with sealed tapered roller bearing assures smooth performance, long rope life.
- ☆ True-circle rope sockets grip full spiral of six strands.

See Your distributor SOON

These new dragline buckets introduce a new standard of performance and increase the efficiency of dragline operation. Three types are available — light, medium, and heavy-duty — with solid or perforated baskets. Your Bucyrus-Erie distributor is fully qualified to help you select the right size and type of bucket for your job. See him soon.

12R56C

SEND FOR FREE BULLETIN!

BUCYRUS ERIE

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

☐ Please send me a copy of the new dragline bucket bulletin.

☐ Have a representative call.

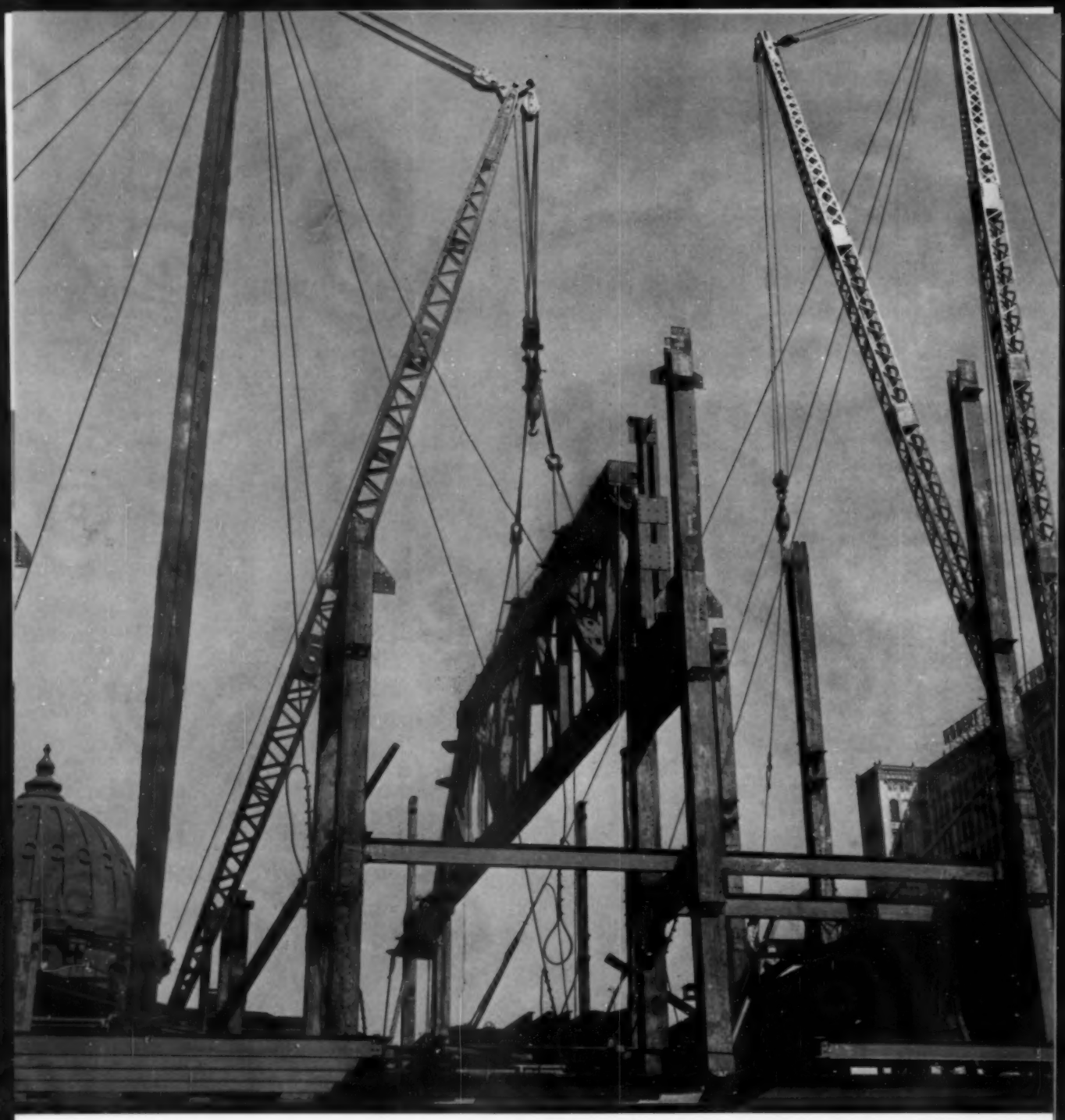
NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

12R56C



Architects for new Sheraton Hotel: Perry, Shaw, Hepburn and Dean, Boston; Structural Engineer: Maurice A. Reidy, Boston; General Contractor: McCloskey and Co., Philadelphia

Wire Rope at Work—Philadelphians are soon to have a great new hotel—the Sheraton. A 22-story building with de luxe features from lobby to roof, the Sheraton will be a unit of Penn Center, in the very heart of the city. It is to cost approximately $14,000,000.

Here is a picture taken as the steel skeleton was going up. It shows the erection of a 53-ton fabricated truss—one of five designed to support the ballroom ceiling and upper floors of the building. Muscle for the job was supplied by Bethlehem wire rope, Purple Strand grade, which has the strength and fatigue-resistance for even the heaviest lifts. As a matter of fact, it could hoist such trusses all day long and still be ready for more.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributors*-Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

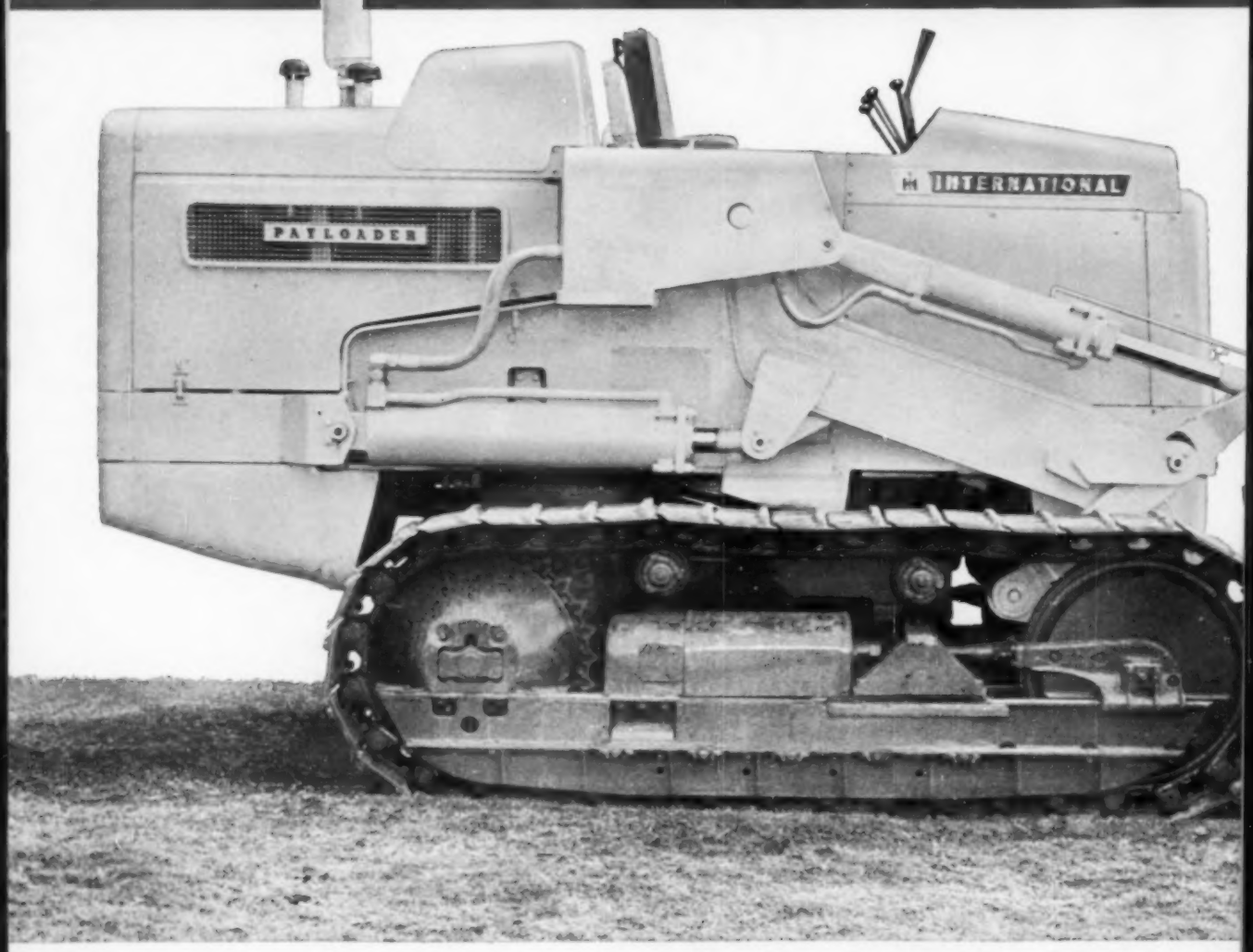
MARION operators *ride on air*

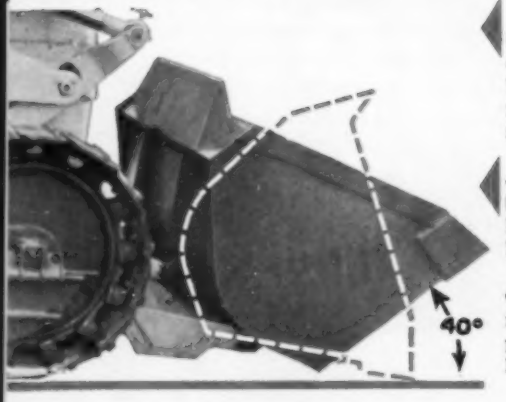
. . . . . well, it's <u>almost</u> like riding a cloud when Marion Air Control takes the heavy push and pull out of shovel running. You control main machine motions with a maximum of only 12 pounds hand pressure. You can inch the load or hold it with simple wrist pressure. Operators stay fresh and fast all shift long. Cycle time is shortened without extra effort. Machinery lasts longer. Marion <u>engineered</u> air control has thoroughly proved its value in the field; requires minimum maintenance. Ask your Marion distributor what it can mean on your work. Your output rises when your operator rides on air.

MARION POWER SHOVEL COMPANY
MARION, OHIO

AMAZING !... NEW !...

Rear-engine 1¾ yard





PRY-OUT BUCKET ACTION: Tremendous 17,500-lb pry-out force is obtained by using break-out pads on ground as fulcrum for leverage. This transfers load forces to ground instead of to machine.

40° BUCKET TIP-BACK AT GROUND LEVEL permits digging of bigger bucket loads, *plus* retaining of more of load in bucket during lifting and carrying.

OPERATOR SITS COMFORTABLY in foam-rubber seat, handles conveniently-placed, power-boosted controls, can see load and cutting edge at all times.

International® Payloader®

- **New—this highly-maneuverable crawler tractor-loader with "power-shift" transmission teamed with Torque-Converter advantages—to give you maximum possible material-moving capacity and speed in any given condition.**
- **Operator sits up front, close to bucket, can always see what he's loading, where he's going.**
- **Speed unmatched in crawler history, 10 mph forward, 13 mph reverse, provides faster cycles.**

If it's *speed* and *maneuverability* and *big capacity* you want in a crawler-loader, see the new International 1¾ yard Model 12 Payloader!

This amazing new 91½ hp loader seats its operator *in front of the engine*, up close to the bucket, where he has an unobstructed view of everything from cutting edge to toe of bank. It balances the tractor between rear-mounted engine and front-mounted bucket. Weight is evenly distributed over entire length of tracks. You get better traction, longer track life, better stability on grades, less bogging down in spongy ground.

Your operator moves faster on this new Payloader, too. He can go up to 10 mph forward, 13 mph in reverse. He changes speeds or direction instantly through a full-power shift, three-speed transmission. No waiting, no stopping, ever! *All* shifts through *all* speeds can be made in either forward or reverse under full engine speed WITHOUT SLOWING DOWN. Torque-converter gives you maximum digging-power for the toughest jobs. (Operation gets *another* boost from the torque converter . . . it provides an infinite range of speeds, automatically selecting the one which best balances load and torque.) Steering is a finger-tip cinch, too, because each *steering clutch* and *brake* is controlled by one power-boosted lever *only* (no foot steering brakes).

Try this new International Model 12 Payloader for yourself. Your International Industrial Power Distributor will be glad to demonstrate. Call him soon! A good deal awaits you!

INTERNATIONAL HARVESTER

International Industrial Power

180 N. MICHIGAN AVENUE—CHICAGO 80, ILLINOIS

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractor and Rubber-Tired Loaders . . . Diesel and Carbureted Engines

Excavating Engineer
founded 1905 MAY, 1956

Davison Chemical Co.'s Bonny Lake Mine uses this 1,800-ft. long system of 30-in. conveyor belts to carry overburden to spoil pile.

Florida's Deepest Phosphate

THE Davison Chemical Co., a division of W. R. Grace & Co., Baltimore, Md., operates the deepest phosphate mine in Florida. Its holdings encompass 17,000 acres, not all minable, including plant and utilities areas. One such property is a drying and shipping plant at Ridgewood, Fla. At its two mines, Bonny Lake and Pauway No. 4, the company works 100 to 120 acres annually.

It's a big operation with big problems. Economically, Davison's biggest problem is overburden. The problem resolves itself into two parts—how to strip overburden quickly and cheaply in such deep excavations, and how to dispose of it efficiently.

As overburden is stripped and the excavation deepens, draglines must swing farther down and out to reach the material. To get the necessary reach, large draglines may be used, but they are often too heavy to be practical on such unstable ground. Draglines, if they are to reach the material, must work close to the edge of the bank—too close for safety.

A large Florida phosphate producer moves the field's deepest overburden through use of small draglines to strip off the top cut and portable conveyor belt sections to handle disposal.

New Stripping Plan

When the overburden became too deep, Davison came up with a new plan, which is working out well. Two Bucyrus-Erie 54-B draglines strip a bench or top cut from the overburden. Because of their relatively light weight, these draglines can operate fairly close to the edge of the excavation. They are equipped with 70-ft. booms and 3½-yd. Hendrix type LS perforated buckets. Both machines are equipped with Buda diesels.

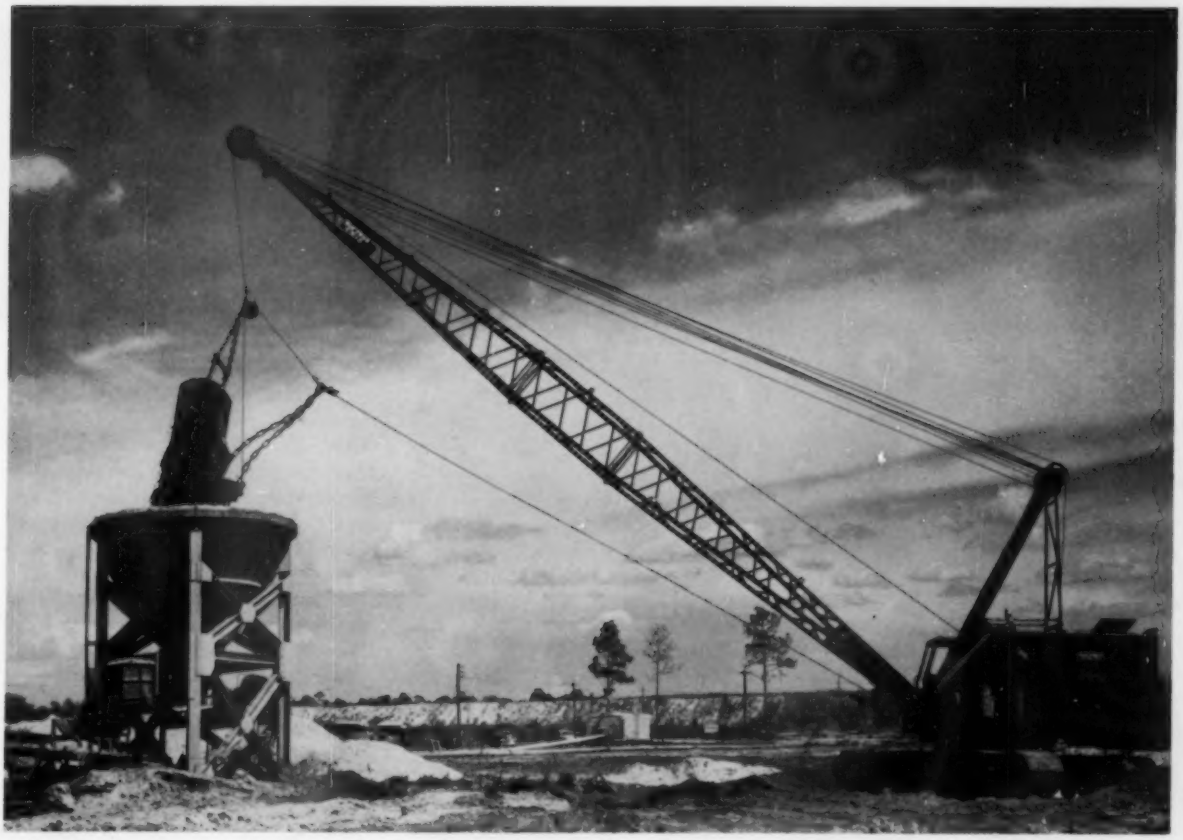
After the 54-B's strip the top bench of overburden, a Bucyrus-Erie 650-B walking dragline, carrying a 195-ft. boom and 16-yd. bucket, scoops up the rest of the overburden and then mines the phosphate ore. Company procedure is to keep two shifts on overburden to one on mining. When *Excavating Engineer* visited Davison's Bonny Lake Mine, the two 54-B's were taking off a 15-ft. bench, and the 650-B was removing the next 40 feet. There was approximately

a 15-ft. section of rock under that, bringing the total depth to 70 feet.

Once overburden has been stripped, an efficient and economical method must be found for disposing of it—and in such a way that it won't impede future operations. Originally, the company hauled it away with tractors and scrapers. This method proved costly. Sluicing, or washing away with powerful hoses, was found to be more economical but a difficult and inconvenient practice. It also made necessary reservation of a large land area for waste disposal.

Then the present method of disposal was tried. It embodies a portable 30-in. conveyor belt system, continuously carrying material away unless shut down. The set-up consists of one main section 1,200 feet long, six 100-ft. feeder sections, an elevated stacker, and a slinger. Thirty 40-ft. sections tied together make up the main belt. The belt sections are manufactured by United States Rubber Co., New York, N. Y. The small draglines load to the six 100-ft. sections, weighing 18,000 pounds each, which move material to the long gathering conveyor. The 1,200-ft. continuous belt

As overburden material is brought in by the conveyor at the rate of 600 fpm, it accumulates under the stacking machine. A Cat D8 dozer keeps the spoil pile leveled.



A dragline dumps a 3½-yd. load into a hopper. The top layer of overburden is stripped by two 54-B's, the rest by a 650-B.

(Above) An oscillating pan feeder doles out material from hopper to conveyor belt.
(Below) Mark German, assistant project engineer, inspects the overburden slinger.

is powered by a General Electric 75-hp motor; the 100-ft. sections by General Electric 25-hp motors. These motors are totally enclosed to protect them against dust and moisture. A picker stationed along the conveyor belt snatches roots and other objects from the line.

A section of ground 400 feet wide, 200 feet on each side of the conveyor line, and approximately 1,200 feet long can be bench stripped by the dragline-belt system at one time. When an area has been completely worked, 54-B's move the belt, which can be dismantled, to the next location, a process which takes about 30 hours.

From the conveyor belt the material is discharged to the 60-ft. stacker, pow-

A 16-yd. Bucyrus-Erie 650-B walking dragline mines phosphate matrix as mucky overburden is carried away on a 30-in. belt.

ered by a General Electric 50-hp motor. The stacker rises at a 17° angle and delivers at the rate of 600 fpm. When the conveyor system was set up, the discharge was allowed to pile up under the stacker, and was pushed over the bank with a Caterpillar "U"-type D8 dozer with Hyster winch and derrick.

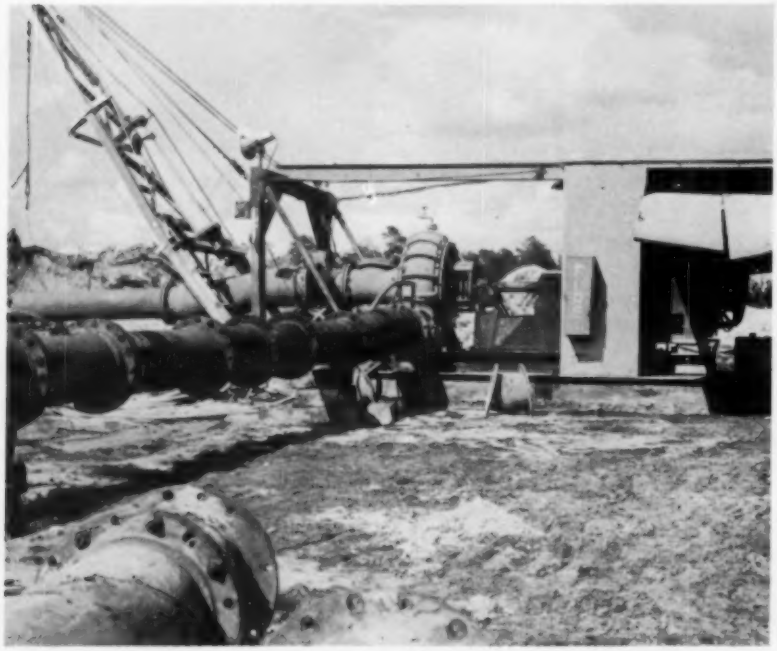
In July, 1955, however, a new Stephens-Adamson slinger was put into operation. Built like a carloader, only bigger, it throws dirt over the edge of the spoil pile a distance of 60 feet. A General Electric 50-hp motor powers its 24-in. belt. Mark German, assistant project engineer, was in charge of perfecting this machine for its special use at Davison's Bonny Lake Mine. The company added special scaffolds and skids to adapt it to conditions at the mine. It handles all types of material—sand, hardpan, and muck, delivering at a rate of 2,800 fpm or 600 tons per hour. Because the material stacks dry, it takes up less pile space than formerly.

High Dragline Output

In this field, the 650-B delivers large yardages. Very little swing is called for; the 650-B can often windrow material out in front of it. The nature of the material helps out, too. It piles well in the bucket, sometimes sticks straight up from the bucket teeth. Operators frequently get heaping loads with a 10% overload.

The ore is loaded to a sump where it is made into a slurry. It is picked up by a portable "pump car" or dredge with a 16-in. Georgia Iron Works dredge-type pump and 500-hp motor. Two hydraulic monitors at the front of this pump use 4,000 gpm at 165 psi tip pressure. They sluice the material back to the pump. There it is sucked into a 16-in. pipe line approximately 5,400 feet long. Two "lift" or booster pumps are used to keep the material moving rapidly. They have pumped up to a distance of 6,400 feet in this area. In another section they once pumped 8,000 feet. Four boosters were used at that time. The pumps are now working five days on only two shifts. Booster pumps

The big dragline turns over a load of phosphate matrix to the sump. Pipeline in foreground brings in water under high pressure.



A Georgia Iron Works pump powered by a 500-hp electric motor draws up the phosphate slurry and sends it on its journey to the processing plant almost a mile away.

now on the line are an Amsco and a Georgia Iron Works. Parallel to this phosphate pipe is another 16-in. pipe, which carries water. It is powered by an Allis-Chalmers pump.

A washer at the plant, composed of screens and logs, separates the coarse fraction to 14 mesh. Minus 14 mesh to plus 35 mesh is separated in one of three ways—by Humphrey Spirals, Diester tables, or belts. Denver flotation rigs separate minus 35 mesh to 150 mesh. Drying, and sometimes grinding, comes next.

Davison bought out Southern Phosphate in 1946 and merged with W. R. Grace & Co. in 1954. John M. Harris is manager of the Florida phosphate division. Other key men are: W. R. Fort, production superintendent; Jack Frost, chief engineer; B. P. Jones, general mining superintendent; and B. W. Johnson and H. Greene, project engineers. Prior to the recent merger the company was known as the Davison Chemical Corp.

The Bonny Lake Mine described above has an annual production covering 40 to

60 acres. W. A. Allen is superintendent of this mine. Pauway No. 4, Davison's other mine, is located eight miles due north of the Bonny Lake location and is superintended by F. H. Elliott. Two Bucyrus-Erie walking draglines, a 9-W and 320-B, take care of the stripping and mining there.

At both mines Davison has established an outstanding safety record. A citation from the National Safety Council hangs in the plantation-type house which serves as the main office. Two other buildings are used as offices, one for engineering activities and the other for personnel.

Supervisers are (from left) B. P. Jones, general mining superintendent; W. A. Allen, Bonny Lake Mine superintendent; and H. Wheelis, recovery plant superintendent.

Main Source of Supply

Florida producers together supply 75% of the phosphate used in this country and 60% of the phosphate used in the world. It comes to approximately 10 million tons annually. All this phosphate is found in Polk and eastern Hillsboro counties. The story of its formation is an interesting study.

Some 10 million years ago these two counties in north central Florida were submerged in a vast but shallow sea which was home to the shark, the whale, and the manatee. Most present-day animals or their ancestors were already on hand, but the lions, saber-toothed tigers, camels, horses, mammoths, mastodons, ground sloths, giant armadillos, tapirs, dire wolves, and peccaries then present formed a strange and mottled group.

For thousands of years the bones of these animals contributed to the formation of a vast mineral storehouse. The earth's crust in this glacial age was going through a period of upheaval. As land fought with sea, the bones of countless animals were washed along by streams into a final resting place, the shallow sea that is now Polk County. Exposed to the vagaries of the weather, limestone in these deposits dissolved into the turbulent waters, but phosphate,

Continued on page 70

Two hydraulic monitors sluice down matrix into a sump pond from which the watery solution is pumped into a 16-in. pipeline.

Smoke rises from the stacks of the Blue Diamond mill where calciners remove moisture from pulverized gypsum ore. The resulting product is a fine, powder-like material.

Gypsum: Forgotten Industry of Las Vegas

by Ray Day

BELIEVE it or not, Las Vegas is the home of something besides gambling.

High on a lofty mountain range overlooking the Nevada gambling mecca, is southern Nevada's contribution to modern industry: a gypsum products mill and mine owned by Blue Diamond Corp., of Los Angeles, Calif. Pure white gypsum, extracted in gleaming fragments from deep under the crust of these brown mountains is used for the manufacture of wallboard, perforated plasterboard, and every type of plaster —including the kind a dentist uses when he casts impressions for a set of false teeth. Gypsum rock is sent from here in gondola-type cars to cement mills over the entire Southwest. The big 370-man operation, including plant and mine, is a far cry from the plush, glittering gambling establishments along the fabulous Las Vegas strip. This is an industrial mill which contrasts with the gambling mills only 23 miles away. It is a mill and a town and a mine, set out in the vast loneliness of the Nevada desert.

Gypsum produced at this location is serving a rapidly expanding building market from San Francisco to San Diego, covering a big section of the United States Southwest. Started back in the depression years 27 years ago as a source of material for low-cost home construction, the mining operation has expanded into an industry of no small magnitude. The original mining operation has grown to the point where 1,500 tons of gypsum and almost twice that much tonnage of hard lime rock overburden are being moved six days a week. Thanks to modern excavating equipment, the original room-and-pillar system of mining has been replaced by the more modern, safe open-cut method. And since 1941, Blue Diamond has built and operated a modern gypsum products mill at the base of a cliff beneath the quarry site, where the material can be processed, packaged, or sent out in sheets in finished form.

Open-Cut Mining

Present day mining operations are a far cry from those original depression days when miners were glad to get jobs digging out the white gold by the old room-and-pillar method. Even while that method was being used, modern excavating equipment was being perfected to handle big yardages on a sustained basis. In the 1940's there was some open-cut stripping and excavation of gypsum ledges where the overburden was not too deep. As of two years ago, the change-over from underground mining to open-cut surface excavation was complete. Now all mining done is a surface operation.

The mine location is in one of southern Nevada's typical dolomite areas where rock occurs in sedimentary types and is quite hard. At Blue Diamond's mine, however, the lime cap rock is siliceous rather than a dolomite limestone. It averages 25 feet thick and often runs as deep as 30 feet. This overburden covers a ledge of solid, white gypsum of high purity. In fact, present manufacturing specifications observed by Blue

An important source of gypsum for the Southwest's booming construction industry is located in the middle of a vast, lonely desert country near one of the most unlikely cities in the world.

Diamond require the use of 98% pure material.

The topography is rugged. Great jagged cliffs and canyons rise sharply from the vast desert canyon floor and merge into a rugged mountain range in the background. The closest distance from the gypsum mining operation to the manufacturing plant is 3,600 feet—straight down over a cliff and canyons. The elevation drop in that 3,600 feet is 1,000 feet, or a slope of 1 on 3.6. Since it was uneconomical to attempt construction of haul roads or to invest in hauling equipment, around the point of this steep hill an aerial tramway system was devised to transport gypsum to the plant. This was the most efficient and most economical scheme feasible.

The operation is ultra-modern, measured by any standard. Open-pit mining is moving some of the hardest limestone in the western United States. It is limestone hard enough to make veteran drillers scratch their heads in amazement. But modern equipment and excavating methods, which will be detailed a little bit later, have solved all mine problems. And the erection of modern lath, plasterboard and plaster mill equipment has solved whatever problems existed in the industrial end of this venture.

Principal governing factors in the selection of equipment for an open-cut mining operation were the probable size of the market demand, and the ability of equipment to meet this market demand safely with a desirable reserve margin. Some variation in equipment also is necessary because of the dissimilarity—particularly in drilling and shooting—of the inert, soft gypsum compared with the extremely hard, brittle limestone overcapping.

A modified large-diameter powder hole technique has been adopted by Blue Diamond, consisting of a Joy Heavyweight Champion rotary drill operating

A Euc loaded with white chunks of ore climbs a steep ramp up to the main haul road. Material is dumped directly into a grizzly feeder which routes it to the hammermill.

On the quarry level high above the mill, a 1½-yd. Link-Belt Speeder loads ore while a 1½-yd. Bucyrus-Erie shovel digs overburden.

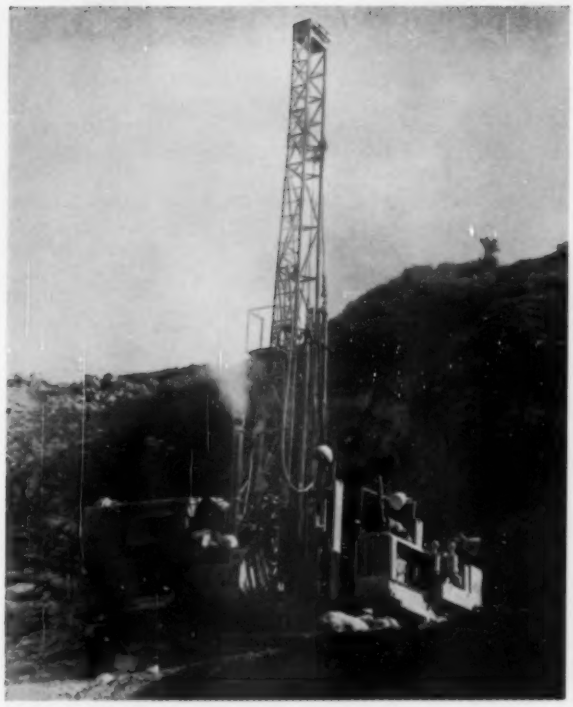
Hughes 6¼-in. diameter Tri-Cone bits. This machine is being used exclusively for powder-hole drilling in the hard lime overcapping. This cap rock is being drilled on a 15 x 15-ft. grid, with holes extending down to the gypsum formation.

Drilling has ranged from moderate to very difficult, with drill bit life on Hughes W-7-R bits averaging approximately 425 feet. Minimums and maximums have been 300 to an excess of 1,000 feet. In some places the limestone overcapping has been almost cherty, and has been very difficult to drill.

Powder holes in the overburden rock are being loaded at present with Hercules bag X granular powder of 65% strength. Experiments have been conducted with other types of powder, including the new ammonium-nitrate types like Akremite, and additional experimental work is still in progress. Up to 30 tons of powder are exploded at a time on heavy shots in this material. A Primacord detonating system, activated with electric caps, is being used.

Drilling in the soft, inert gypsum is

(Above) Overburden is lime cap rock averaging 25 feet thick. (Below) Nearly 35 tons of explosives are used up in a single shot.



A Joy rotary sinks powder holes in overburden. Small-diameter holes in sticky gypsum ore are drilled by two Ingersoll-Rand units.

different entirely. Instead of hard-rock bits, Kennemetal auger-type bits are used to sink 2¼-in. holes on 6-ft. square centers. These bits dull slightly, but they are reground and used again.

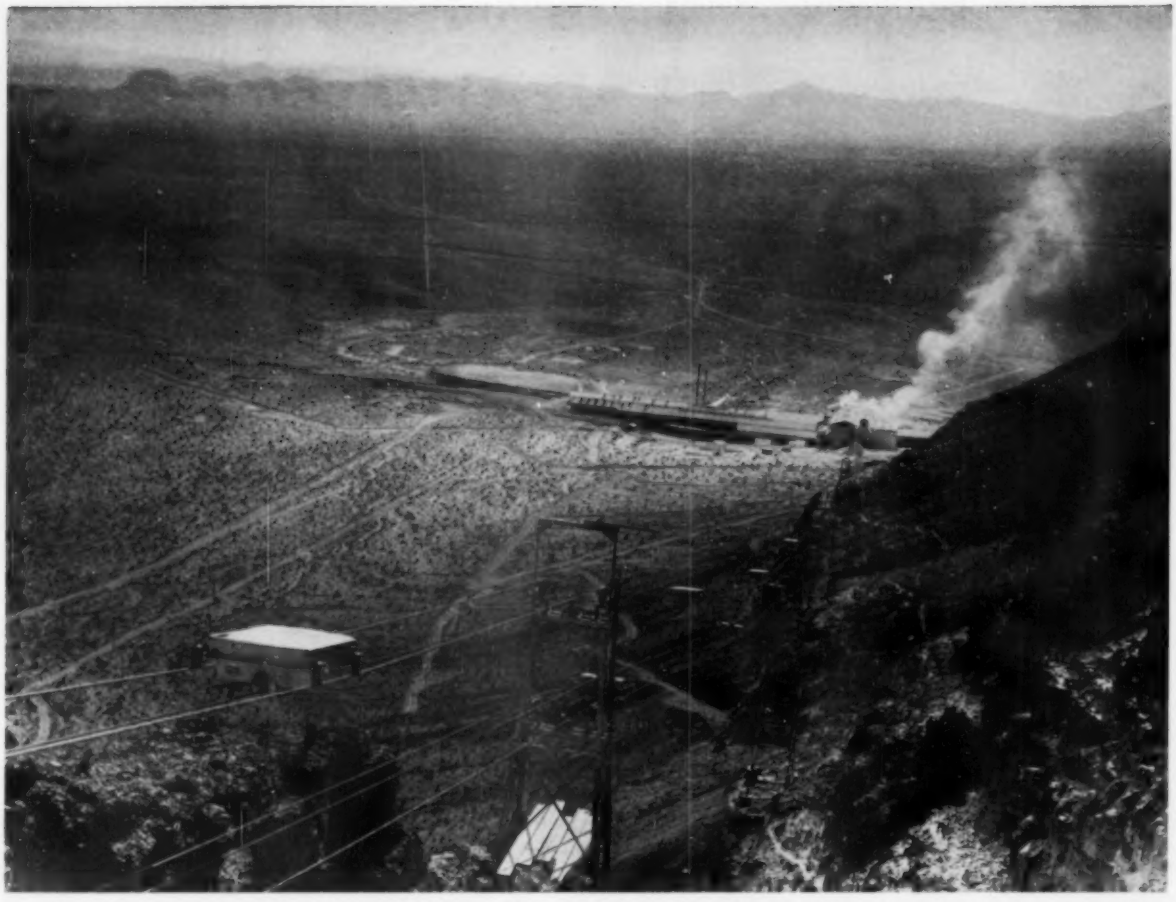
Home-Made Drills

Two interesting rigs have been developed, largely through the mine operating staff, for efficient drilling in gypsum. One of these is an Ingersoll-Rand 55-J wagon drill, mounted on an Air-Trak carriage. The Air-Trak carriage is self-propelled by means of an air motor controlling each of its crawler tracks. The mast of the wagon drill was extended to 20 feet, so that steel changes could be reduced or eliminated entirely. Drill bits for this rig were specially drilled for carrying a charge of compressed air down through the drill stem and out into the bottom of the hole, thus blowing out cuttings and dust from the gypsum drilling. The scheme has paid off by increasing this type of typical 2¼-in. diameter hole drilling from two feet per minute to seven feet per minute. The rig just mentioned, for example, has done a 16-ft. deep hole in one minute and 48 seconds.

The other gypsum drilling machine is a 55-J Ingersoll-Rand, mounted on an old Gardner-Denver wagon drill frame. This frame was widened and equipped with rubber tires. Its center of gravity was so high that heavy rollers from the big Raymond mill in the manufacturing plant were scattered at three low points around the carriage. The same type of steel and drill bits are being used on this machine, as on the Air-Trak mounted rig. These two machines have largely replaced two conventional wagon drills which formerly were used. The use of auger rather than rock-type bits has enabled drilling to be done rapidly and with increased efficiency. The two wagon drills averaged 1,000 tons drilled out per shift. One auger drill now averages in excess of 2,000 tons drilled out per shift. Both air augers get compressed air from two 600-cfm Ingersoll-Rand Gyro Flo compressors.

Gypsum, a very difficult material to fragment, is broken with Hercules bag X powder. To control these blasts, Her-

A big Cat D9 dozer keeps the pit floor clean around the stripping shovel. All waste material lying above the pure gypsum ledge is removed to prevent contamination.



Pulverized gypsum is carried down from the high quarry level to the mill on the desert floor via a 3,800-ft. tramway system.

cules aluminum shells with 20-ft. iron leads are being used, with Hercules millisecond delays. On a 16-row shot, for example, delays from 0 through 16 will be used. If there are more than 16 holes, delays are staggered between lines to give the desired breaking effect. On a typical shot as many as 600 holes will be fired at one time, resulting in approximately 20,000 tons of broken gypsum. Thus far, according to mine officials, Hercules bag X explosives have proven the most uniform, the easiest to handle, and have given the best fragmentation in both types of materials. Even on the hard lime capping, it is rare when pieces come out too big to be loaded by a 2½-yd. dipper.

All loading and hauling, whether on pure gypsum or on the lime capping, is being done by power shovels and a truck fleet. The limestone cap rock is being excavated after blasting by a Link-Belt Speeder K-580 power shovel, carrying a 2½-yd. Amsco dipper. Loading of broken gypsum is being done by a Link-Belt Speeder K-370 machine, carrying a 1½-yd. Amsco dipper. A new Bucyrus-Erie 38-B power shovel with 1½-yd. Amsco dipper has recently been brought in as an all-purpose machine, either to load gypsum or remove stripped material when necessary. When *Excavating Engineer* visited the project, the 38-B was busy on what is considered the mine's toughest assignment—the excavation of the limestone overcapping which lies just above the gypsum ledge. Combined output of the Link-Belt Speeder and the 38-B shovel is about 3,000 cubic yards in eight hours.

Hauling Units

In the hauling fleet are three 31-TD Euclid end-dump units with oil-filled Hydra-tarders. One of these units was being used on disposal of waste overburden. Other hauling units include four 27-FD Euclids, built up with sideboards to increase their capacity. The number of hauling units assigned to each shovel is balanced as required, depending on the length of haul, so that power shovels keep busy loading as much as possible. A new Cat D9 dozer has been brought in on a rental basis from Las Vegas. This big, high-capacity, powerful machine is being used along with a D8 to keep the pit floor clean around the stripping shovel, and to remove the last particles of waste lying directly over the gypsum formation. Drilling of the gypsum ledge is not attempted until the overburden has been excavated and the pit floor dozed clean, the object being to eliminate any contaminating foreign material from the pure gypsum.

Disposal of waste overburden material is being made in a canyon averaging less than 1,000 feet from the digging site. Gypsum, which is broken out in white chunks and loaded to Euclids, is hauled up a steep ramp to a main haul road leading about one-half mile from the mine to a reduction plant just over the gypsum products mill. The Euclids dump their loads directly into a Sheridan single-pass grizzly feeder, which routes a full load of material as needed into one of the largest hammermills in the west-

ern states. The big hammermill is a Jeffry 54x70 swing-hammer pulverizer. Function of the big unit, which is driven by a 450-hp electric motor, is to reduce the gypsum chunks to minus 2-in. size. Gypsum tends to break down rapidly under crushing, so most of the material leaving the hammermill has been pulverized far below the minus 2-in. size. Much of the material is powder.

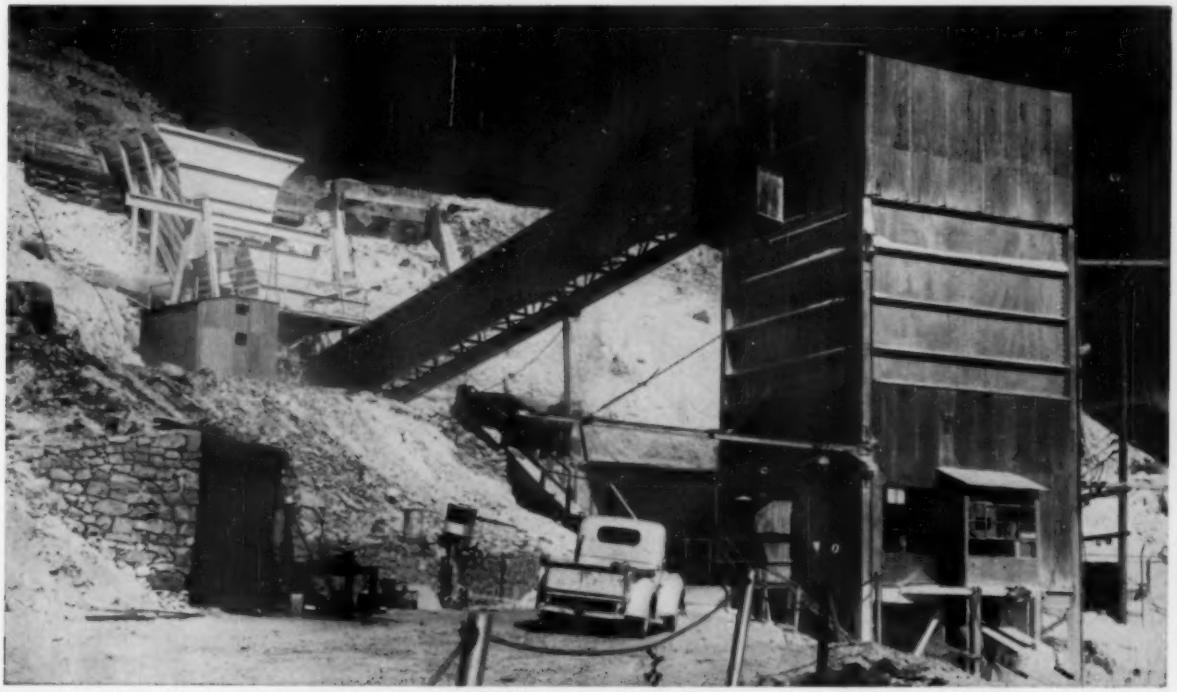
Equipment repair headquarters are housed in this quonset hut. Part of the old mining camp which housed miners' families in bygone days appears in the background.

Measuring Hopper

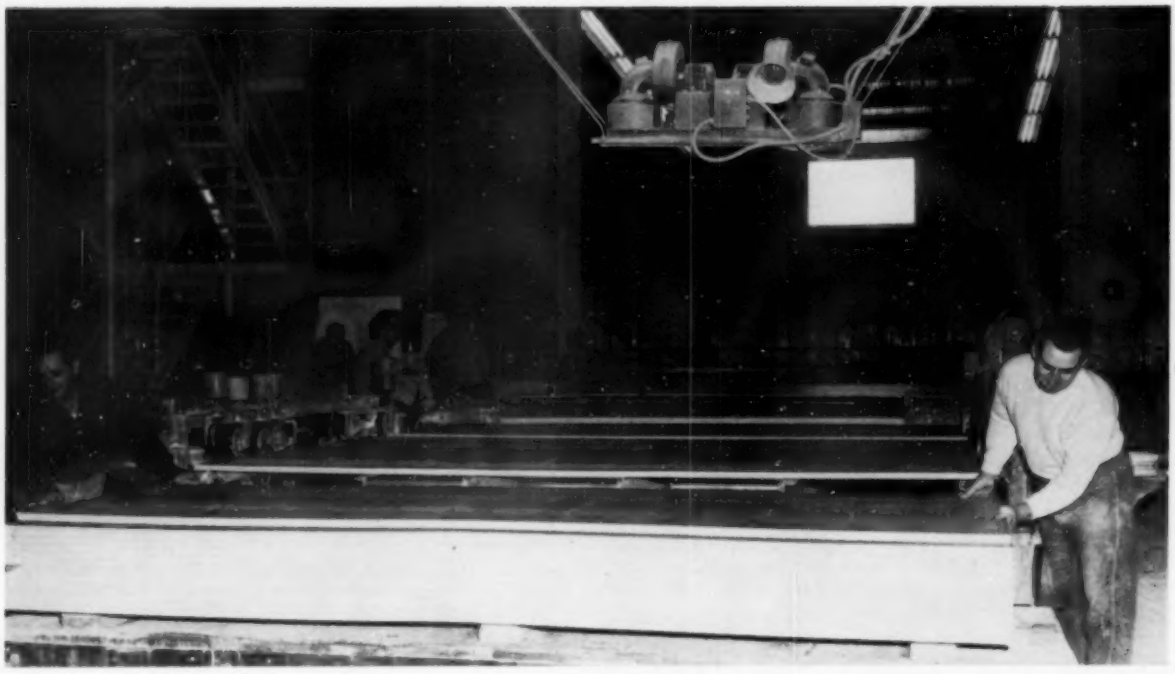
From the hammermill, the pulverized material passes to a set of storage bins. These feed a measuring hopper in which batches of the material automatically are measured. A swing bottom under this hopper, which is actuated by a trigger mechanism, drops approximately 1,750 pounds of fine gypsum into each car as it moves underneath the hopper. To catch any overflow material, a secondary hopper leads down to a bucket elevator and short return conveyor, arranged in closed circuit with the measuring hopper. As a result, whatever material spills in filling the bucket as it moves along, re-enters the measuring hopper and is not wasted.

The tramway feeding the gypsum products mill is an Interstate Loop-Line aerial tram. There are 54 buckets on the line. The buckets are connected by socketed haul line sections so that a continuous flexible line results. The bull wheel at the top of the tram is equipped with grippers that act on the haul line to keep it from slipping. The buckets carrying the load from the tram to the mill bunker ride on two track cables. After going around the mill bunker run-around and discharging their load, they return upside down on another set of track cables. The track cables are supported by means of structural steel towers leading from the face of the cliff down precipitous moutain country to the mill 3,800 feet away.

Finish operations at the gypsum products mill are fairly typical of those in use in this industry all over the country. The general idea behind gypsum products is that gypsum is a material which will always return to its original state under proper moisture conditions. For example, 100% gypsum rock, when dug out of the mountainside



At the reduction plant chunks of ore are dumped into the receiving hopper at upper left, processed, and loaded into tram cars.



At the mill a production crew works at the end of one of the wallboard manufacturing lines where panels are bound and inspected.

contains about 20.9% water of crystallization. If this material is calcined to approximately 6%, ground, and bagged, it makes a very fine plaster-like powder. It stays that way until enough water is added to make it workable. At that point is combines with water to the 20.9% water of crystallization mark. It is then set up to the solid semi-rock state which it originally assumed in the mountain deposit.

Material Improved

In the plaster-making process, several ingredients are added to make the gypsum an even better material. Resin from the pine forests of the South is added to produce air-bubble voids. Cornstarch from the Midwest is added to protect the typical sharp-edged gypsum crystals as they are processed, and to permit these edges to penetrate and fuse with paper binding. Strengthening fibers, in the form of finely ground pulp, frequently are added to give the material greater strength than can be achieved in its natural state.

Passing through the plant, the gypsum goes through a set of rock bins. These feed a Raymond pulverizing mill, which grinds the gypsum down to fine powder. Other major features in its route through the plant include more distribution bins, conveyor belts and calcining kettles, where the material is heated to drive off combined water. A plasterboard and lath plant takes a slurry of this material and shapes it into thin, flat sheets for use in the wallboard and plaster-lath industry. If the material is destined for bagging in the plaster plant, it must be re-routed to a regrind bin. Here are burrstones, which grind the material down to plaster consistency. Approximately 40 finished carloads of building and plaster materials now are

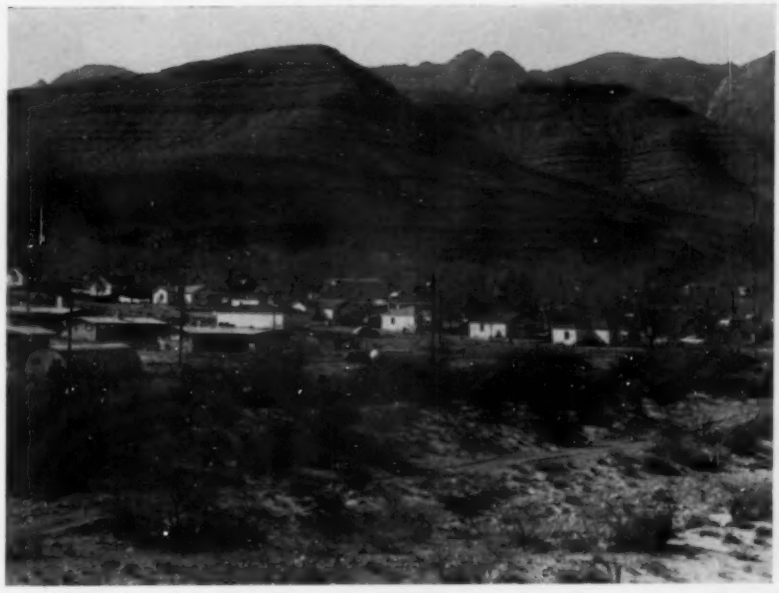
Plaster from Blue Diamond's mill serves a vast market from San Francisco to San Diego, Calif. Here is one of many batteries of sacking machines on the assembly line.

being shipped daily from the Blue Diamond mill.

Carefully controlled laboratory conditions are maintained throughout the plant, so that a uniform material meeting today's highest building specifications is produced. Desirable setting times for plaster, for example, must vary from the eight-minute norm a dentist likes when he makes the impression for somebody's false teeth to a five-hour norm which a plasterer must have to do a good job on the walls in someone's home. At various stages in the manufacturing operation, retarders and set accelerators are both used as necessary to control behavior characteristics of this material.

To an excavation man, one of the most critical tasks of the Nevada mine is the upkeep of power shovel and other equipment which must work the year round under exceptionally hot, dusty, arid desert conditions. Gypsum mining invariably produces a cloud of white, filmy dust. It hangs like a pall, pervading everything. It is hard on air cleaners, hard on bearings, and demanding on even the best of lubricants. To make matters worse, the hard limestone overcapping is about as tough and abrasive a substance as the Southwest offers, so far as dipper teeth and lips are concerned.

Blue Diamond has established a 60 x 80-ft. quonset hut maintenance headquarters at the top of the hill where the mine is located. Here practically all service work to the mine fleet is done, and major repairs also are made. The 2½-yd. Link-Belt shovel was receiving a major overhaul when the job was visited.



Blue Diamond Corp. even has its own town. Blue Diamond, Nev., is a modern, well-planned community where many of the 370-man crew live with their families.

Equipment maintenance consists chiefly of a preventive program as recommended by the manufacturers of the various equipment units, with a view toward prolonging the effective working time of machinery between equipment repairs. Then when repairs are in-

Continued on page 70

Wallboard is loaded to open cars by a Hyster forklift truck. Paper covering provides protection for short distance shipments.

A 3-yd. shovel, equipped with a General Motors 6-110 engine and a torque converter, loads dump with rock from Dale Cut.

Pennsylvania Adds to Turnpike System

WHEN it comes to having a modern highway system, Pennsylvania stands in the front section in the listing of states.

Pennsylvania originated modern pay-as-you-go turnpikes in the United States. Nearly 16 years ago—Oct. 1, 1940, to be exact—the state opened the original Pennsylvania Turnpike, 160 miles of four-lane, divided highway extending from near Harrisburg to near Pittsburgh.

Pennsylvanians closely observed the experiment; so did citizens of other states, including legislators. They were anxious to learn whether such a toll road actually could pay for itself, or whether it would fall into distress and require assistance from state coffers—at the degradation of other roads in the state highway system.

The Pennsylvania Turnpike did not fail, although gasoline and tire rationing during World War II severely handicapped the undertaking by virtually eliminating non-essential civilian travel. With the end of the war, however, the road began to prosper, as predicted.

With success of the Pennsylvania Turnpike proven, other states began constructing and planning similar toll roads of their own. The list of completed turnpikes now includes, among

110-mile Northeastern Extension will run from Plymouth Meeting north to Scranton. Badgett Mine Stripping Corp. has tough rock job in 7.3-mile contract, including one cut of a million yards.

others, those in New Jersey, New York, Ohio, West Virginia, Kentucky, New Hampshire and Maine. Indiana, Massachusetts and Kansas are scheduled to complete turnpikes this year. Connecticut and Florida have started to build turnpikes.

And Pennsylvania, the mountainous and populous state that links the densely settled East with the industrial Midwest, was not content to rest on its abutments in the matter of further turnpike construction. Not by a long shot.

By late next fall, those original 160 miles of Pennsylvania Turnpike will have been increased to 470 miles. When all authorized extensions are completed, the turnpike system will total 750 miles.

Three extensions totalling 200 miles were added to the original turnpike to carry it from the Ohio border, where it now connects with the Ohio Turnpike, eastward to the Delaware River. Pennsylvania and New Jersey now are bridging the Delaware. The bridge, scheduled to be completed soon, will link the two turnpikes.

With the opening of the Indiana Toll Road late this year, the traveler may motor from Chicago to New York on an unbroken turnpike system.

As this is being written, men and machines are working on the Delaware River Bridge. Still others are constructing the remaining 62½ miles of the Northeastern Extension of the turnpike.

The 110-mile long Northeastern Extension will run from a point near Plymouth Meeting on the Delaware River Extension northward to a point north of Scranton. A 47.6-mile section of the Northeastern Extension, from Plymouth Meeting north to a temporary interchange near Emerald, was opened last December. The remainder of the extension is scheduled to be opened to traffic next fall.

Plan Lateral Leg

A 46-mile lateral leg of the Northwestern Extension is in the advanced-planning stage. This leg, running between the Ohio and New York lines, will be the "top of the T" section of the Northwestern Extension. The stem of the T will run from a point near Erie southward to a point on the existing turnpike.

The legislature last June approved the Pennsylvania Turnpike Keystone Shortway Act, which authorizes the construction of another east-west turnpike completely spanning the state from a point near Sharon to a point near Stroudsburg in the east. This turnpike will be north of the existing superhighway.

Also approved last summer was the Pennsylvania Turnpike Southwestern Extension Act, which authorizes construction of a turnpike from a connection with the present system west of Pittsburgh southward to the West Virginia border. The Southwestern Extension will be designed to connect with the West Virginia Turnpike.

All Pennsylvania Turnpike construction is financed by revenue bonds. Total cost of the original section, the three east-west extensions, the Northeastern Extension and Pennsylvania's share of the Delaware River Bridge is $538,500,000. The Northeastern Extension and the Delaware Bridge are covered under one bond issue of $233 million.

This report will restrict itself generally to the Northeastern Extension and particularly to the tough rock job the Badgett Mine Stripping Corp., Madisonville, Ky., has on Sections 37F and 37G.

Turnpike construction in Pennsylvania is demanding, for Pennsylvania is a state of mountains and hills. The ex-

Continued on page 42

A backdrop is provided by a long fill as a 2½-yd. shovel, also positioned in the Dale Cut, drops rock into Athey wagon.

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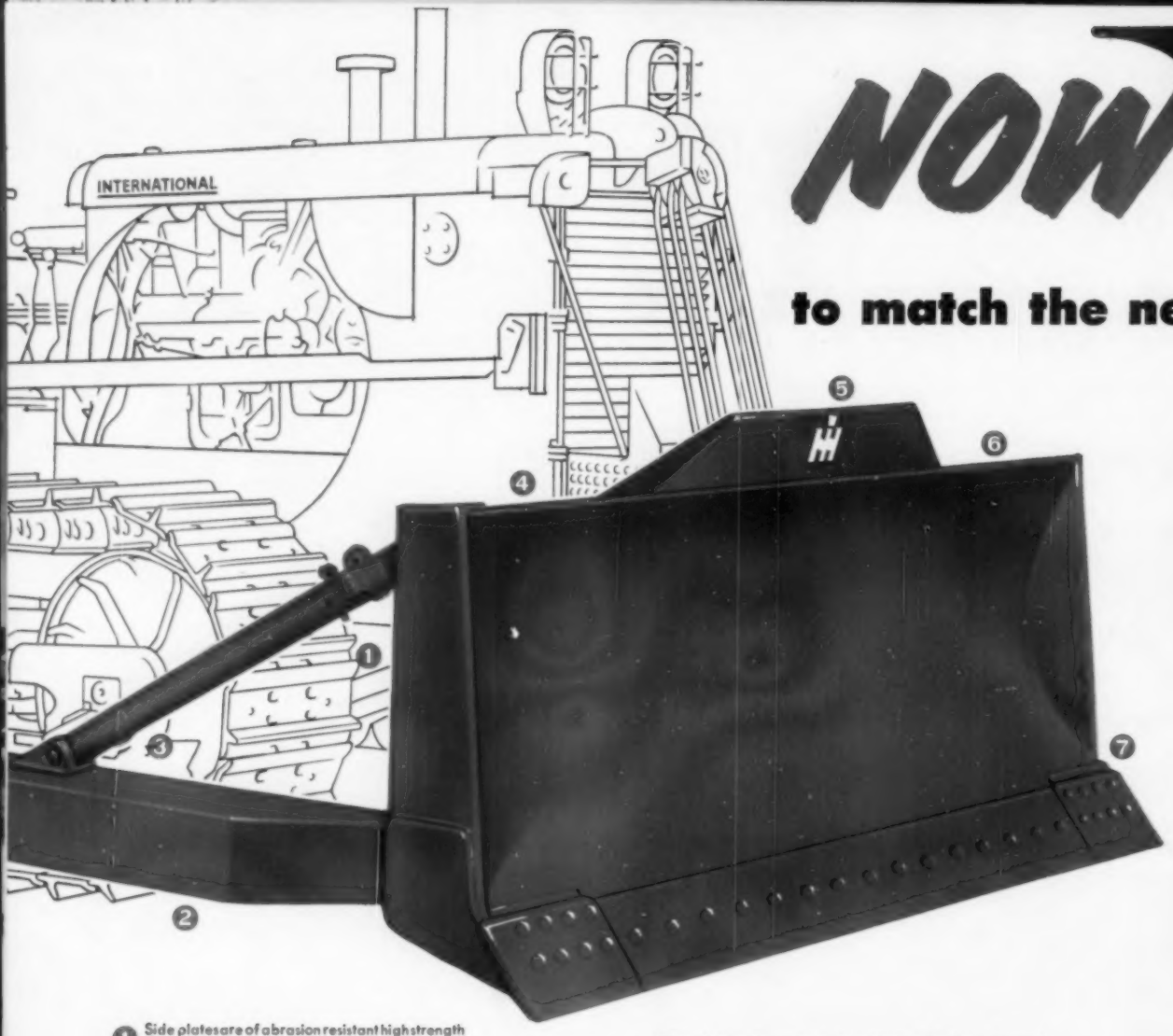
to match the new



1. Side plates are of abrasion resistant high strength steel, securely fused to moldboard and box sections by low-hydrogen welding. They prevent load spillage, allow you to carry larger loads. Standard on all International bulldozer blades.

2. Push arms are sturdily constructed of box sections. Side plates are mill-rolled with integral back-up bars to support top and bottom plates. Machine welding guarantees uniformity of weld.

3. Headless pins, locked by eye bolts, secure struts to blade. For removal, pins can be driven out in either direction. On hydraulic blades, all control linkage is connected to the blade through self-aligning bearings.

4. Entire perimeter of blade is backed by heavy box channels solidly fused to moldboard. With this type of construction moldboard, box channels, and welds flex freely to prevent weld failure.

5. Spillboard is wide and high to prevent spillage over top of blade. Note that it is curved to match the contour of the moldboard, thus aiding boiling action. Width of moldboard allows you to carry full load for which the blade was intended.

6. Moldboard is formed from a single sheet of low-alloy, high-strength steel. International blade is shaped to perfect curvature in a special forming machine to assure uniform strength and stress resistance over entire area.

7. Shear bars welded to moldboard support end bits and relieve stress on end bit bolts. Lower edge of end plate is reinforced by wear plate to add strength at corners, increase wear resistance.

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To make full use of the greater work capacity of the new Bonus-Powered International crawler tractors, we now offer a complete line of newly designed blades matched to tractor power.

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Write For New Blade Literature: An illustrated specification list of the *228* attachments available for International crawler tractors is just off the presses. For your free copy of Mailing Folder CR-492-F, write Consumer Relations Department, International Harvester Company, 180 North Michigan Avenue, Chicago 1, Illinois. No obligation, of course.

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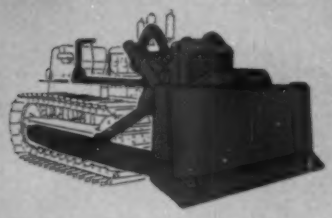
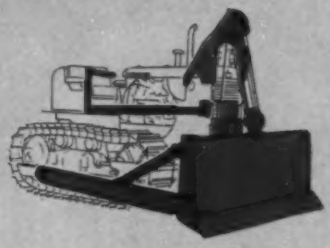
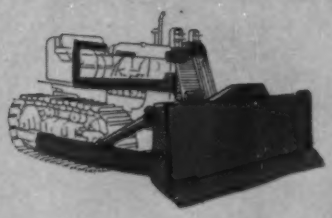


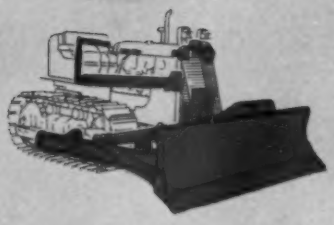
Direct Lift Hydraulic Bulldozer
Operates off front-mounted, gear-driven pump which gives fast blade action. Self-aligning bearings prevent binding of linkage.



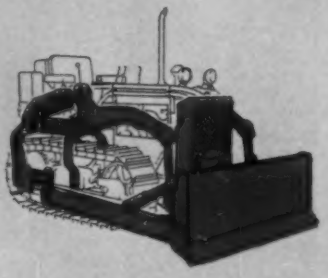
High-Gantry Cable Bulldozer
Operates off either front or rear-mounted International cable control unit. Available for TD-24, TD-18, and TD-14 tractors.



Low-Gantry Cable Bulldozer
Operates off either front or rear-mounted International cable control units. Available for TD-24, TD-18, and TD-14 tractors.



Hydraulic or Cable Bullgrader
Operates off high or low gantry, front or rear cable controls on TD-24, TD-18, and TD-14 tractors. Hydraulic bullgrader also for TD-9, TD-6, and T-6 tractors.



Track Frame Mounted Bulldozer—Distributes the load evenly over the length of the tracks. Available only for TD-9, TD-6, and T-6 tractors. Bullgrader also available.

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A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractor and Rubber-Tired Loaders . . . Diesel and Carbureted Engines

(Above) This is the junction of operating Turnpike and Northeastern Extension. (Below) Extension is shown in aerial view.

Turnpike . . .

Continued from page 39

isting 360-mile turnpike chisels its way through the Allegheny and Appalachian Mountains. Chisel is an appropriate word, for the turnpike passes through seven tunnels with a combined length of 35,000 feet.

Yet, on all segments of the turnpike —new, old and forthcoming—the maximum grade is 3%, the minimum sight distance is 1,000 feet and the maximum radius of curves is 6°.

Much of the Northeastern Extension will pass through the Appalachians. This represents some difficult rock cuts and one tunnel job. The .88-mile T. J. Evans Tunnel, near Palmerton, is being put through by Lipsett, Inc., Philadelphia, Pa., under a $4,490,743.15 contract.

Badgett Job Tough

The Badgett Corp. has one of the tough excavating jobs on the Northeastern Extension. Badgett successfully bidded contracts for three sections of the northern half of the Extension. One, the 4.41-mile Section 37B south of the Pocono exchange, already has been completed. The contract price was $2,388,-986.35. Roger Badgett, president of the firm, was in charge of Section 37B, on which 1 million yards of material were moved.

This article will be interested in the

Only top part of the 71-B's boom shows in view looking north in Dale Cut. At right is a 6-in. Ingersoll-Rand Drillmaster.

Badgett job that embraces the combination of two sections totalling 7.3 miles south and east of Wilkes-Barre. The northernmost section, 37G, is 3.72 miles long; section 37F is 3.58 miles long. Badgett's contract is for $5,448,529.24, the second largest award on the project.

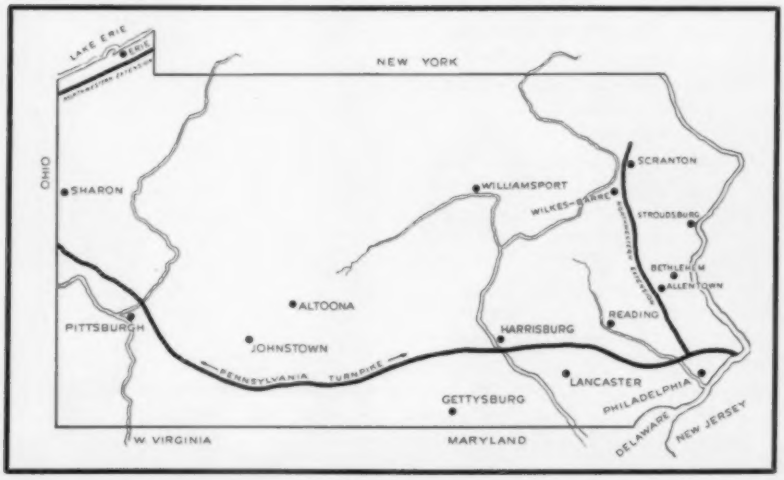
Brown Badgett, vice president of the Kentucky firm that had its roots in the coal stripping business, is general superintendent of the intense activity on sections 37F and G.

Badgett's job is characterized by tough rock cuts and difficult drilling and shooting.

"We've got 2,300,000 yards of excavation in these two sections, and 65% of it is rock, the hard sandstone that is typical of the turnpike," said Brown Badgett. "We've also got 600,000 yards of borrow to place in embankments."

Badgett, a personable and bespectacled Kentuckian not far advanced in years, had more time than usual to discuss his project from the warmth of his trailer-field office located just off the turnpike right-of-way. A snowstorm had halted operations on the first of two days *Excavating Engineer* visited the job. The snow was followed by sleet and rain.

A 3-in. snow cover didn't deter Badgett's men the next day, however, and production resumed at nearly full pace. With the job scheduled to be completed by next fall, production must be main-



Pennsylvania's Turnpike system opened in 1940 with a 160-mile section. With opening of the entire Northeastern Extension, the system will have a total of 470 miles.

Carrying two Joy drills, this Caterpillar D6 drill tractor supplements Drillmaster.

(Left) Approximately 25 cubic yards of rock are deposited in fill area by a Caterpillar DW21-Athey PR21 wagon unit.

tained. Badgett began working on the project on April 15, 1955. By February 1, 70% of the grading and excavation had been completed.

A majority of the wintertime activity was centered near the field office, in what is known as the Dale Cut. About 1 million yards of excavation were scheduled to be taken from the 80-ft. cut, which is 3,000 feet long. Badgett was two-thirds through the Dale Cut at the beginning of February.

Because it is in an interchange area in Section 37F, Badgett was anxious to bring the Dale Cut down to grade with dispatch.

Two shovels—a 3-yd. Bucyrus-Erie 71-B and a 2½-yd. Northwest 80-D—were digging in the Dale Cut during *Excavating Engineer's* visit. The abrasive sandstone provided the machines with extremely rugged digging. The 71-B, equipped with a General Motors 6-110 engine and a torque converter, was digging and loading an average of 1,500 yards per 10-hour shift; the 80-D was handling about 1,200 yards per shift, Badgett said.

Working under the two machines were six Cat DW21's pulling 25-yd. Athey PR21 wagons, and six 25-yd. Euclid bottom dumps. The 12 units were hauling more than a mile to a fill area.

Badgett had five other excavators deployed on the job, including a 1½-yd. Bucyrus-Erie 38-B, two 2½-yd. B-E 54-B's, a 3-yd. Lima 1201 and a ¾-yd. Lorain 1041. A 1½-yd. Koehring 605 was scheduled to move in. It had completed an assignment on Badgett's Section 37B.

The 38-B and one of the 54-B's were working side by side in the 150-ft. Quarry Cut on the north side of the job. The 800-ft. long cut will produce 300,000 yards of excavation. Seven or eight Euclid end dumps worked under the two shovels. They had to climb a steep grade before getting into position.

The Euclids working under the 38-B hauled a short distance to a Cedar Rapids rock crusher. The crusher is owned by Susquehanna Quarries, Inc., Millersburg, Pa., which is doing the sub-base crushing for Badgett under sub-contract. Rock excavated by the 54-B was hauled to a fill area.

The Lima 1201 was working on the extreme north end of the job on smaller cuts. The other 54-B was assigned to a borrow area. The Lorain had been cutting parallel ditches.

Average 12,000 Yards Daily

Badgett said that his shovels during the tough winter were averaging between 12,000 to 15,000 yards of excavation per day. The average during the good summer months was between 22,000 and 25,000 yards daily.

Badgett's hauling equipment includes the six DW21-PR21 units, a LeTourneau-Super C Roadster 13-yd. dump unit and the following Euclids: three 63-TD end dumps, 22 yards heaped; four 60-TD end dumps, 22 yards; 15 27FD end dumps, 13 yards; two 23TDT bottom dumps, 25 yards; and seven 43FDT bottom dumps, 13 yards. Also available are two 43FDT water wagons.

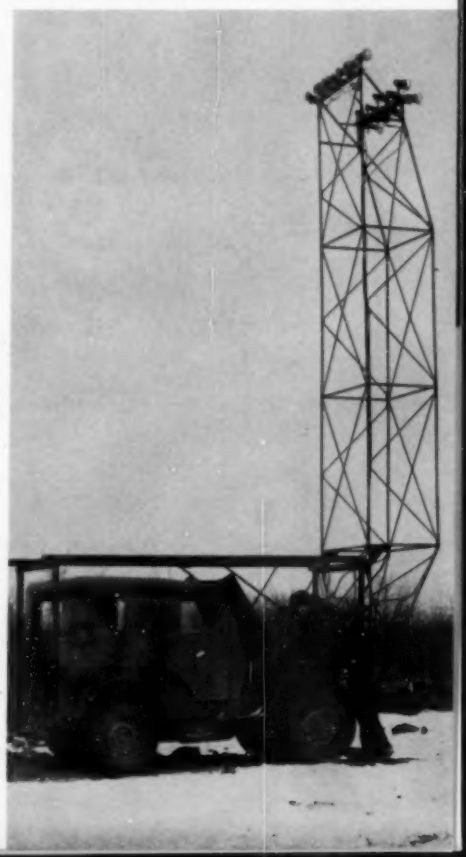
Badgett also has four Euclid 18½-yd. 23TDT scrapers and three Model 286 tractor-drawn Gar Wood scrapers with a 24-yd. capacity.

Tractor equipment includes two Allis-Chalmers HD-21 and two HD-9 dozers; two HD-20 push loaders; two International TD-24 push loaders and one TD-24 dozer; and nine Caterpillar D8, one D7 and two D6 dozers.

Brown Badgett believes that the most difficult phase of the job is the drilling and shooting.

"We've hit a variant type of rock which is very abrasive to bits," he said. Badgett is using Ingersoll-Rand carbide

Badgett uses seven of these Jeep plants to provide light for night shift work.



(Left) Fill is leveled by a Cat D8 dozer. (Right) Euclid makes fuel stop on way back to shovel after placing a load of fill.

bits. Average bit life has been 750 to 800 feet.

A 6-in. Ingersoll-Rand Drillmaster mounted on an HD-20 tractor, Badgett's largest drill, was working in the Dale Cut. Other drilling equipment includes three Cat D8 tractors, each carrying a Worthington compressor and two Worthington WP-40 drills; one Cat D6 drill tractor, carrying two Joy drills and using a portable Gardner-Denver 600-cfm compressor; and four Ingersoll-Rand and two Gardner-Denver wagon drills. All drills except the I-R Drillmaster are putting down 2½-in. holes.

Portable compressor equipment includes two Gardner-Denver 600's, two Ingersoll-Rand Gyro-Flo 600's and two G-D 105's.

Badgett generally is drilling 25-ft. deep holes on 15-ft. centers with the Drillmaster. The smaller drills are sinking 14-ft. holes on 5-ft. centers.

All major makes of powder are used for the blasts. Delays are employed as necessary.

Million-Yard Fill

In addition to the Dale and Quarry cuts, the two sections include seven or eight other cuts ranging from 30 to 40 feet. The biggest fill—that for the bridge over Bear Mountain Road—will require a million yards of material dumped in 2-ft. lifts. The bridge is 90 feet above Bear Mountain Road. Two other fills, separated by a small cut, will take 500,000 yards. Generally, Badgett's fills are frequent and the hauls are short.

Structural work is being done under sub-contract by the Joseph Futch Construction Co., Exeter, Pa. The job includes four bridges, seven box culverts and three arch culverts.

One of the bridges will be in the interchange area. The other three will carry the turnpike over state highways 933 and 115 and over Bear Mountain Road.

Clearing was subbed to Wyoming Valley Nurseries, Wyoming, Pa. Badgett awarded the paving sub-contract to the Williams Paving Co., Norfolk, Va. The roadway will have a 10-in. concrete surface. The 6-in. sub-base will be of crushed stone.

About 200 men have been employed

Three drilling rigs—two Caterpillar D8 tractors carrying Worthington drills and compressors, and a Joy—sink blast holes.

(Above) Working side by side in Quarry Cut, a 38-B and a 54-B load fleet of Eucs. (Below) Here is closer view of the 38-B.

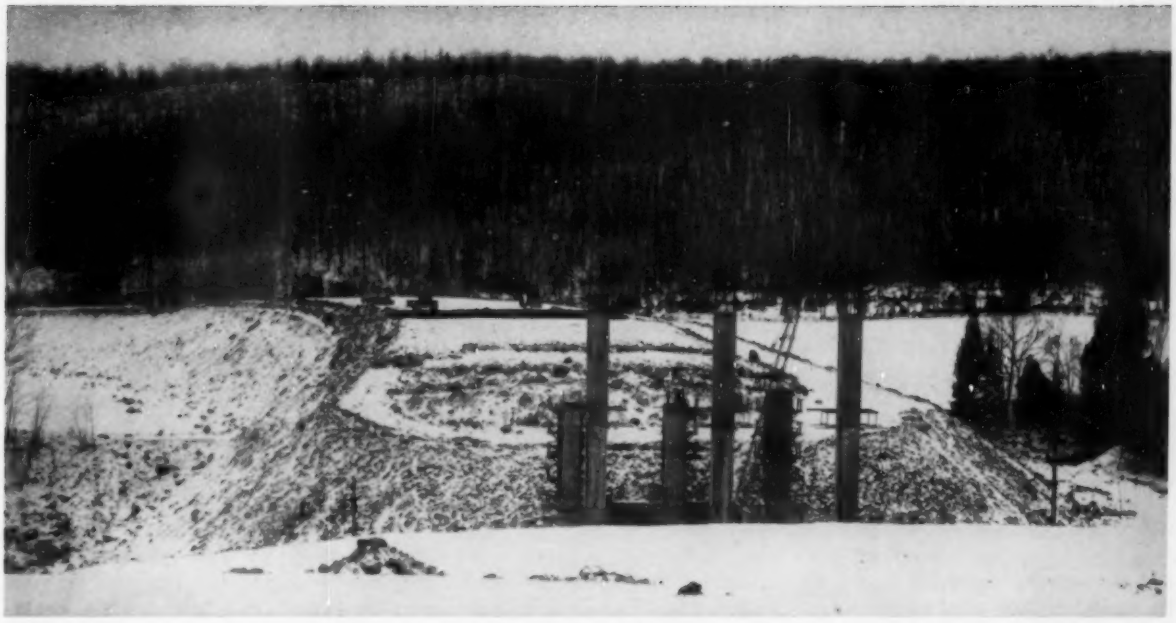
by Badgett on two 10-hour shifts. Lighting for the night work is provided by seven Jeep light plants, powered by motor-driven General Electric generators. The towers are collapsible.

The tough nature of the Turnpike job means considerable maintenance. A large shop has been set up on the north end of the project to handle most of the major maintenance. Major engine repairs, however, are handled at Madisonville. Two lube trucks service equipment in the field during and between shifts.

Weather caused some delays in the project. The hurricane which struck the East, including Pennsylvania, last August washed out so many bridges leading to the Badgett job that it made difficult for a while the assembly of work crews.

"And this winter has been the coldest around here in several years," Brown Badgett said. "But we're just about on schedule, though, in spite of it."

Brown Badgett moved to the Pennsylvania Turnpike project from Missouri, where he helped direct the placing



Fill area is shown as piers go up for the bridge that will carry the Turnpike over Bear Mountain Road. Crane is a Marion.

of 4 million yards in embankments on an Arkansas River flood control job.

Other Badgett officials on the job include: Scott Talbott, superintendent; Ed Jones, chief engineer; Cliff Julen, master mechanic; Othal Taylor, maintenance superintendent; Judson Jarrells, powder foreman; and Gene Knight, office manager.

These men follow the progress of the job through a Motorola two-way radio system.

So goes the Badgett job.

The Northeastern Extension, just as the other completed sections of the Pennsylvania Turnpike, will be a four-lane divided highway. One major exception has been made in the design of the Northeastern Extension, however.

Instead of a grassed median strip separating the 24-ft. wide roadways, the Northeastern Extension will have as a median barrier a cement mall 4-ft. wide and 8-in. thick. The turnpike is 76 feet wide.

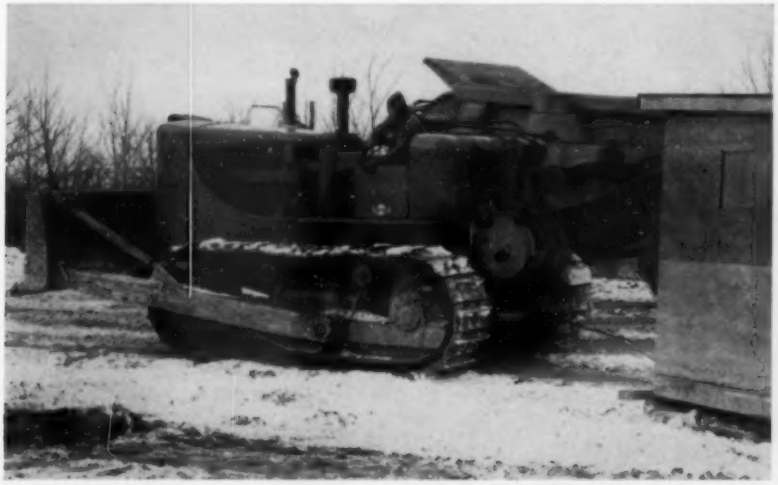
Pennsylvania's policy of erecting its turnpikes on the sunny side of the mountains and well above all known flood levels is in effect on the Northeastern Extension.

Included in the Extension will be 133 bridges, the T. J. Evans Tunnel, 142 culverts and one extensive retaining wall. Five of the bridges are major structures. The bridges and their builders are:

1. Lehigh River, South Crossing, and Pohopoco Creek Bridge, Carbon County

Continued on page 68

Brown Badgett, vice president, is general superintendent of sections 37 F-G.



An Allis-Chalmers HD-21 dozer pulls a hut to a new location. Badgett's excavation in two sections totalling 7.3 miles near Wilkes-Barre will be about 2,300,000 yards.

News from the Field

Little Rock Plans Expressway

The engineering phase of a new $28 million Little Rock-North Little Rock, Ark. super highway has now been completed and plans covering route location, design characteristics, interchanges, Arkansas River bridge, railroad crossings, cost estimates, etc. are being studied by the Arkansas State Highway Commission. According to Brown and Blauvelt, New York, consulting engineers to the commission, completion of the expressway and bridge, including final design and construction, will take about four years at normal construction pace. A "crash" program could complete the job in less than three years.

Extending south from the northern suburbs of North Little Rock, the five-mile highway is projected in an almost straight line through North Little Rock, across the Arkansas River, and through Little Rock to its southern suburbs. Designed for 60-mph speeds, the expressway will free city streets of through traffic from five federal and state routes and will speed local rush hour traffic as well.

The expressway will consist of six express lanes (three in either direction) separated by a 24-ft. wide median and flanked on both sides by 32-ft. wide service roads. The highway and access-ramp pavements are designed of 9-in. thick reinforced Portland cement concrete on a sub-base of gravel or crushed rock. Service-road plans call for 3-in. thick asphalt concrete in two courses placed on a 6-in. concrete base course.

Grade separation structures will carry a number of through streets across the expressway to permit free movement of city traffic and to provide adequate access to the expressway itself. The structures will generally be concrete decks on standard rolled beam stringers of composite design.

The main structure of the Arkansas River bridge will be approximately 1,570 feet long with viaduct approaches bringing the total to 3,040 feet. Main river spans will consist of two continuous girders with transverse floor beams and longitudinal stringers supporting the decks. They will be supported on concrete piers resting directly on rock. Approach spans on both ends will be of a rolled beam composite construction. They will be carried on steel bents resting on concrete footings supported by piles driven to rock. The United States Army Corps of Engineers has approved the location and plan of the bridge.

Seven interchanges will be provided, two at expressway terminals and five within the cities proper. Three of these, those at the ends and the one at the Little Rock end of the bridge, require circular movements of some of the access ramps. The others consist of ramps in a diamond pattern between the expressway and service roads.

NCA Names Chairmen

National Constructors Association committee chairmen for 1956 were announced recently by C. D. Haxby, president. The organization is composed of leading national firms engaged in the engineering and construction of chemical plants, steel plants, petroleum refineries and power plants.

Members named are: labor committee—Paul L. Wetcher, C. F. Braun & Co., Alhambra, Calif.; safety committee—C. A. Clore, The Girdler Co., Louisville, Ky., chairman, and H. B. Wallace, Koppers Co., Pittsburgh, Pa., co-chairman; foreign committee—R. E. Atkinson, Koppers Co., chairman and F. L. Doherty, Stone & Webster Engi-

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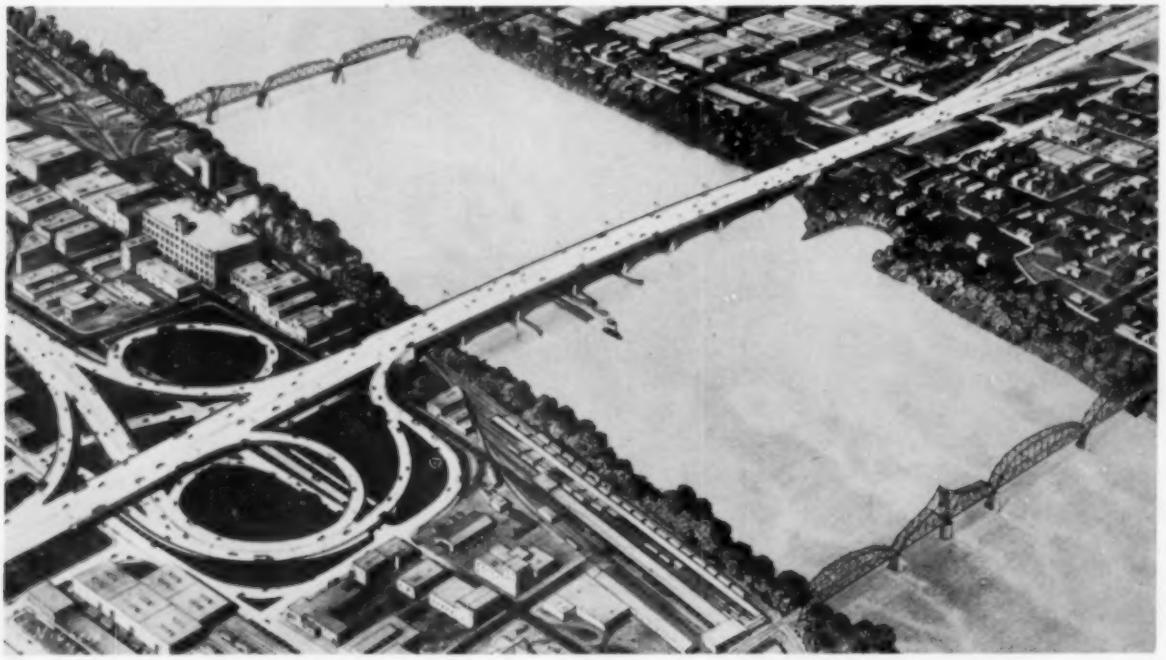
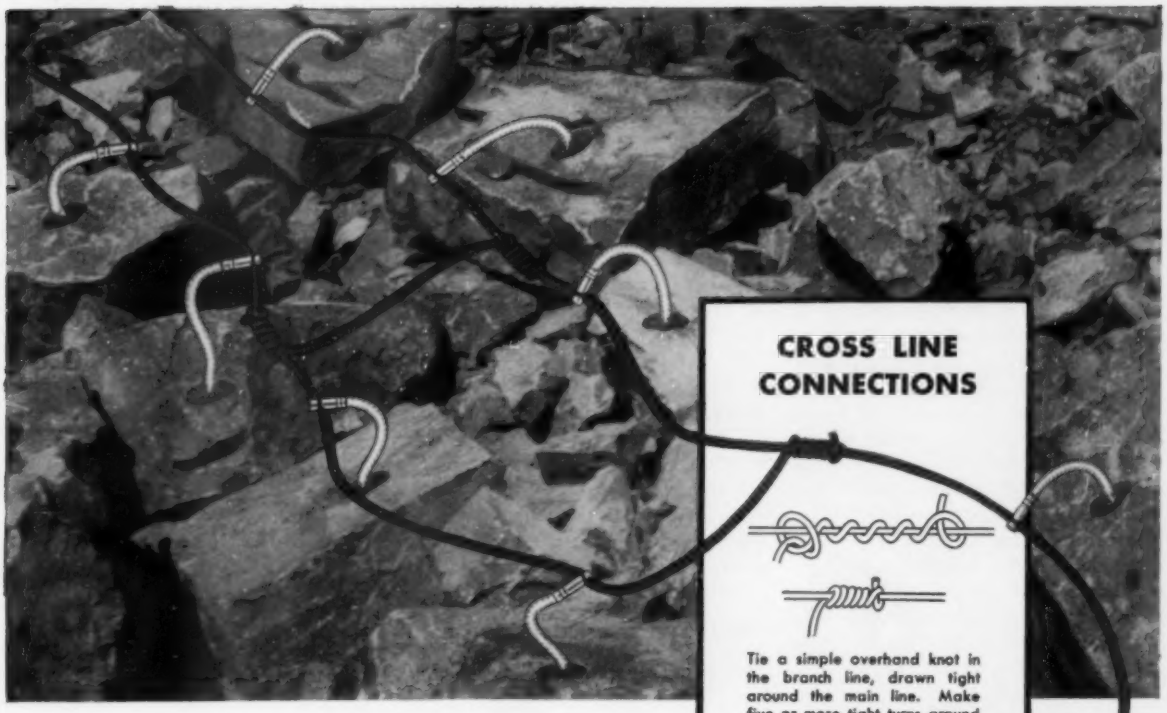


Engineering studies have been made for a $28 million expressway at Little Rock, Ark. Major feature is a 1,570-ft. river bridge.



CROSS LINE CONNECTIONS

Tie a simple overhand knot in the branch line, drawn tight around the main line. Make five or more tight turns around the main line and pull end tight through last loop.

MAIN LINE CONNECTIONS

Lay ends parallel and tie them together with two overhand knots, pulled up tight.

In block hole blasting with Safety Fuse, get the fire there — *faster* with *Quarrycord*

Big chunks in a rock pile can cover a lot of territory. You'd like to break them up "pop-pop-pop" in one operation. You want to be able to do this safely when it's convenient, even while thunderstorms threaten. And every man must be off the rock pile before the first hole goes!

All this is possible *now*. Use Ensign-Bickford Safety Fuse in each hole, and connect all fuses with *Quarrycord*.

Quarrycord is a flexible, water-resistant cord specially constructed to burn fast. An external flame travels along the Quarrycord at about one foot per second. A connector is crimped on the free end of each fuse and forms a positive connection for the Quarrycord.

It's very important to plan the hook-up so that each safety fuse has burned below the collar of the hole before the first charges fire. You can do this by using cross connections as shown at the right.

See your Explosives Supplier or write to

THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut
Manufacturers of Primacord® Detonating Fuse, Safety Fuse, Ignitacord®, Blasting Accessories.
Established 1836

ENSIGN-BICKFORD

Quarrycord

for lighting Safety Fuse in Secondary Blasting

Q-2

News . . .

Continued from page 48

neering Corp., Boston, Mass., co-chairman; and public affairs committee—J. J. O'Donnell, The Lummus Co., New York, chairman.

Other officers, in addition to Haxby, who is vice president of The Rust Engineering Co., Pittsburgh, include C. B. Whyte, president of Procon, Inc., Des Plaines, Ill., vice president and C. B. Bronson, association secretary-treasurer.

Seaway Contract Awarded

The first construction contract in the 16-mile long Soulanges section of the St. Lawrence Seaway has been awarded to Atlas-Winston Ltd., Montreal, Que., by the St. Lawrence Seaway Authority. The contract, for the first stage construction of Lower and Upper Beauharnois Locks, is valued at $3,479,750. The second lowest bid, submitted by United Waterways Constructors, Ltd., Montreal, amounted to $3,851,168.

The work includes clearing of the contract site, excavation of some 200,000 cubic yards of common excavation and of some 1,100,000 yards of rock excavation, rock grouting, cofferdam construction and unwatering, construction of service roads and the relocation of a portion of the New York Central Railroad line.

Two single locks with a lift of 47 feet each will be built during later stages. They will raise ship traffic 94 feet from the level of Lake St. Louis to the level of the Beauharnois Power Canal, already built to the required 27-ft. Seaway depth.

CE Officers Assigned

Brigadier General David H. Tulley, assistant chief of engineers for military construction since April, 1953, became commanding general of the Engineer Center and Fort Belvoir, Va., May 1. Tulley succeeded Major General Louis W. Prentiss who retired from the Army after 35 years of service.

Named to replace Tulley as assistant chief is Brigadier General Walter K. Wilson, Jr. He will direct and supervise construction for the Army and the bulk of Air Force military facilities in the continental United States, Alaska, areas northeast of the United States and south of the Mediterranean, and other special construction and engineering projects of the Department of Defense.

N. J. Turnpike Extension Opens

The initial section of the Newark Bay-Hudson County Extension of the New Jersey Turnpike was opened to traffic in April.

The completed section extends from the Newark Airport interchange of the 118-mile turnpike to Bayonne (Avenue E) and includes the new bridge crossing of Newark Bay, now the longest structure on the turnpike. This bridge is 9,650 feet long from abutment to abutment and rises 135 feet above Newark Bay.

The remainder of the extension from Bayonne northward to the entrance of the Holland Tunnel will be opened to traffic by early summer. Completion of the latter section has been affected by current tight steel delivery schedules.

Construction of the extension, which traverses densely populated and highly industrialized areas, involves problems presented by railroad yards, several industrial plants, and existing streets and public utilities.

A major part, about 68% of the entire extension, is being built as a viaduct structure with small sections involving roadway in Bayonne and Jersey City where embankment and fill are used. In each of the latter instances, contractors have placed fill by hydraulic methods, pumping it into place in Bayonne from Newark Bay and in Jersey City from Upper New York Bay in the vicinity of the Statue of Liberty.

The overall cost of the 8.2 mile extension, including real estate, architectural and engineering costs, is approximately $118 million, an average of $14½ million a mile.

The six-lane modern express highway will reduce travel time between Newark and Bayonne by an estimated 50%

Continued on page 52

Louis Dolente

News has been received of the death of Louis Dolente, 77, senior member of the general construction firm of Louis Dolente & Sons, Philadelphia, Pa. Mr. Dolente died February 14. He was a well-known figure in the home building and road construction fields at Philadelphia. He is survived by five sons, four daughters and 28 grandchildren.

The 9,650-ft. Newark Bay bridge of the New Jersey Turnpike Extension was recently opened. Longest structure on the turnpike, it provides 135-ft. clearance for ships.

ANNOUNCING CATERPILLAR'S

NEW NO. 463
LOWBOWL SCRAPER

(four wheel, crawler drawn)

25 cu. yd. heaped 18 cu. yd. struck

11 Reasons Why the No. 463 Delivers Bigger Loads at Lower Costs per Yard!

1. **Lowbowl design,** a new concept developed by and exclusive with Caterpillar, loads more material with less resistance clear to the end of the loading cycle.
2. **Large capacity** without using sideboards—25 cu. yd. heaped.
3. **Easy, fast loading** of full, heaping loads.
4. **Large apron opening** for speedy, easy ejection of sticky material.
5. **Positive 'dozer-type ejection** that sweeps the bowl clean and allows fast, controlled dumping.
6. **Flat bottom** for smooth, level cuts—excellent on any finishing job.
7. **Good digging action** with stinger bit.
8. **Wheels track within cutting edge** for level cuts.
9. **Adjustable rear axle height** that allows bowl leveling with unevenly worn rear tires.
10. **Rugged construction** with high-strength steels for long life, low maintenance costs.
11. **New tubeless tires** for greatly reduced tire maintenance costs.

For bigger production at lower cost on shorter hauls, here's a new CAT* earthmover—the No. 463, featuring Lowbowl design. From stinger bit to ejector, this new scraper is engineered to load, haul and dump with maximum efficiency. You can count on it to deliver top performance with a minimum of down time on your toughest job. For complete information about the No. 463, see your Caterpillar Dealer!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**NEW NO. 463 SCRAPER—
LATEST EXAMPLE OF CATERPILLAR
LEADERSHIP IN ACTION**

News . . .

Continued from page 50

compared to existing routes. Engineering surveys indicate that approximately 15 million vehicles will travel the route during the first full year of operation.

M-K Men Attend School

Maintenance personnel of the Morrison-Knudsen Co., Boise, Idaho, recently completed a training program conducted by a mobile training unit of the Euclid Div., General Motors Corp., Cleveland, Ohio.

Utilizing mock-ups, cut-aways, and component assemblies, the instruction covered preventive maintenance and service procedures for the entire line of Euclid earthmoving equipment. Special emphasis was given to the models owned and operated by Morrison-Knudsen.

Maintenance personnel of the Morrison-Knudsen Co., Boise, Idaho, paused for a group picture during recent training school sessions conducted by G-M's Euclid Division.

Asphalt Institute Names Klessig

The Asphalt Institute, College Park, Ind., has appointed Arvel B. Klessig, Fairmont, Minn., veteran highway engineer, as district engineer serving Minnesota, Iowa and North and South Dakota. Klessig will serve directly under W. L. Hindermann, Institute division engineer at St. Paul.

The new district engineer received his degree in civil engineering from the University of Minnesota in 1934. He served as county highway engineer for Brown and Martin counties before joining the W. Hodgman and Sons, Inc., contracting firm at Fairmont in 1954, as superintendent in charge of bituminous construction in Colorado and South Dakota.

Klessig is chairman of the Minnesota County Engineers Institute at the University of Minnesota and is a past president of the Minnesota County Highway Engineers Association. He is a member of the Minnesota Society of Professional Engineers, the Minnesota Surveyors and Engineers Society and the American Road Builders Association.

Arvel B. Klessig

ASCE Convenes June 4-8

The American Society of Civil Engineers will hold its spring national convention in Knoxville, Tenn., June 4-8. Some 150 American and foreign engineers will present more than 100 technical papers covering eleven major fields of the profession.

The meeting, to be held in the University of Tennessee Student Center, will bring together civil engineers prominent in construction, engineering mechanics, highways, hydraulics, irrigation and drainage, power, sanitary engineering, soil mechanics and foundations, surveying and mapping, structural engineering, waterways, and other branches of engineering.

The Tennessee Valley Authority will be represented by several speakers, including Brigadier General Herbert D. Vogel, TVA chairman; George P. Palo, head structural engineer, TVA, who is president of the host Tennessee Valley section of the ASCE; and Donald H. Mattern, chief, project planning branch, TVA, who is general chairman of the convention.

Other speakers will include Cloide E. Brehm, president of the University of Tennessee; Nathan W. Dougherty, dean of the college of engineering, University of Tennessee; Enoch R. Needles, of New York, president of the ASCE; Gail A. Hathaway, Washington, D.C., past president of the convening society; Wilbur A. Dexheimer, commissioner, Bureau of Reclamation; Reed A. Elliot, chief water control planning engineer, TVA; G. O. Wessenauer, manager of power, TVA; and Emil R. De Luccia, vice president and chief engineer, Pacific Light and Power Co., Portland, Ore.

Papers on dams in the United States and other countries will be sponsored by the power division. Waterways division subjects will include commerce and terminals on the Tennessee and Cumberland rivers and the effect of modern towboat and barge design on the growth of waterborne commerce.

Highway division papers will include mass transportation, the inter-state system and traffic planning. Among papers before the hydraulics division will be an address on civil engineering in the nuclear power age. A panel will take up the responsibilities toward each other of engineering employer and employee.

In the sanitary engineering division discussions will include radioactive sediments in the Tennessee River system and municipal ordinances for industrial wastes.

Carset Jackbits
DRILL FASTER and LAST LONGER

Carsets being used with JR38A Jackdrill.

INGERSOLL-RAND Carset Jackbits, with tungsten carbide cutting edges, have demonstrated cost saving performance on rock drilling jobs all over the world.

Carset Jackbits have *deeper Carbide Inserts* for more footage between grinds—more regrinds per bit. They have *more metal behind the inserts*, providing greater support and longer bit life. *Stronger skirt walls* and *greater bearing area* on the rod shoulders enable the bit body to stand up for the full life of the carbide inserts.

These longer lasting, faster drilling Carset Jackbits, together with Ingersoll-Rand's *complete line* of rock drilling equipment give you an unbeatable combination for overall drilling efficiency. Your nearest I-R representative will be glad to help you pick the combination best suited to your needs.

Carset Jackbits are available in gauge sizes from 1¼" to 3½".

Ingersoll-Rand 15-363
11 Broadway, New York 4, N.Y.

ROCK DRILLS • COMPRESSORS • AIR TOOLS • CENTRIFUGAL PUMPS • TURBO-BLOWERS • CONDENSERS • DIESEL AND GAS ENGINES

Equipment You Ought to Know About

10-yd. Wooldridge Scraper

Manufacturer: Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc., Sunnyvale, Calif.

Claims: The CCS Wooldridge "Cobrette" 10-yd. self-propelled scraper is now being manufactured. Its features include fluid coupling drive, a positive power "Gear Steer" actuated by hydraulic rotary cylinders, specially designed frame and power train to permit one unit to aid in push loading another.

Rated at 7.5 cubic yards struck and 10 yards heaped, the 143-hp diesel-powered unit has speeds up to 30 mph. It is equipped with four 18:00 x 25 tires for ample flotation and traction. The power train includes the fluid coupling, air actuated clutch and transmission and a readily-accessible gear transfer case which permits easy interchange of the

two standard gears to provide optional gear ratios for most effective use of power on each job. This change may be accomplished in the field in approximately two hours without special tools or extra parts, Wooldridge says. The cable control unit is also air actuated.

The "Gear Steer" consists of two powerful hydraulic rotary cylinders mounted on the scraper yoke and geared to the large vertical king pin on the tractor.

The entire front end, tractor frame and power train were specially designed for pushing, enabling two or more "Cobrettes" to assist each other in loading.

Scraper design incorporates the standard CCS Wooldridge principles of "boiling bowl" loading, rear fulcrum leverage, positive full power pivot-tilt ejection and low bowl profile with high ground clearance.

G-D Compressor, Drill

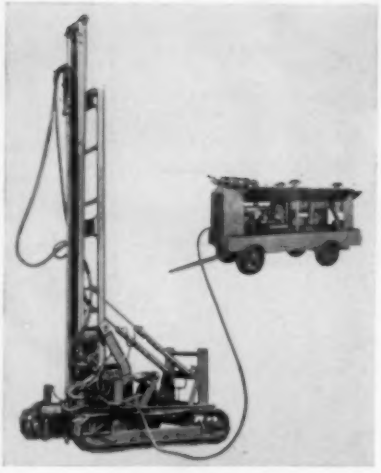
Manufacturer: Gardner-Denver Co., Quincy, Ill.

Claims: Gardner-Denver has announced two new pieces of equipment —the Rotary 900 portable compressor and a 5½-in. percussion rock drill (Model DH143).

The 900 compressor, which delivers 900 cubic feet of air power per minute, is similar in design to the Gardner-Denver Rotary 600.

Gardner-Denver rotaries have a water cooling system that permits steady, full-capacity operation in any climate. A clutch disengages the compressor for easy engine starting. Water from the engine is circulated through tubes in the heat exchanger and oil reservoir to warm the oil and assures immediate oil circulation from engagements.

The Rotary 900 is a two-stage compressor with normal operating pressure of 100 psi.



The Model DH143 rock drill is similar in design to the 4½-in. drill announced last year. The DH143 has a 5½-in. hammer diameter.

The Model DH143 drill offers a selection of bit sizes ranging from 3½ to

Continued on page 56

"The boss would never believe you earned this if he saw that hand!"

ADD PUSH... SUBTRACT FUEL!

AiResearch Turbochargers give your diesel far greater power while actually decreasing fuel consumption, noise and smoke!

In mobile diesel engines, where size, weight and fuel capacity must be limited, AiResearch Turbochargers add more power per inch, pound or gallon of fuel than any comparable installation.

An example is the remarkable success achieved in the recent application of these power packages to Caterpillar diesel machinery.

Equally impressive power increases can be achieved in the application of AiResearch Turbochargers to stationary diesel equipment. Here, the outstanding benefits added to the output boost will be lower operating costs and abatement of noise and smoke problems.

AiResearch is the largest producer of small turbomachinery in the United States, with twenty-five *million* hours of experience. This unmatched experience explains why AiResearch Turbochargers lead in power, economy and dependability. Your inquiries are invited.

THE GARRETT CORPORATION

AiResearch Industrial Division

9225 Aviation Blvd., Los Angeles 45, California

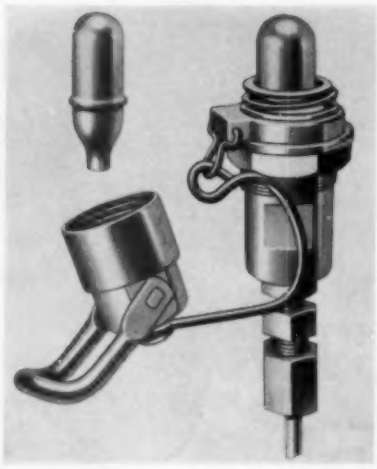
DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY

New Equipment . . .

Continued from page 54

5 inches. A special line of carburized sectional drill rods, couplings and shanks has been developed for use with the DH143.

The DH143 is furnished with an air-powered crawler mounting which is self-propelled and highly maneuverable over rough ground. The chain-feed drilling mast accommodates 20-ft. rod changes and can be hydraulically adjusted to drill toe holes at 15° below the horizontal. The unit will drill horizontal face holes as high as eight feet above the floor. When set to drill at 10° above the horizontal, the bit enters the face at a height of 10 feet. The drill and mast also may be mounted on the user's heavy-duty diesel tractor.



Cat Attachments

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: Caterpillar is producing a number of new attachments for some of its equipment.

Improved direct electric starting systems are being manufactured as attachments for D6, D4 and D2 tractors and the No. 977, 955 and 933 Traxcavators.

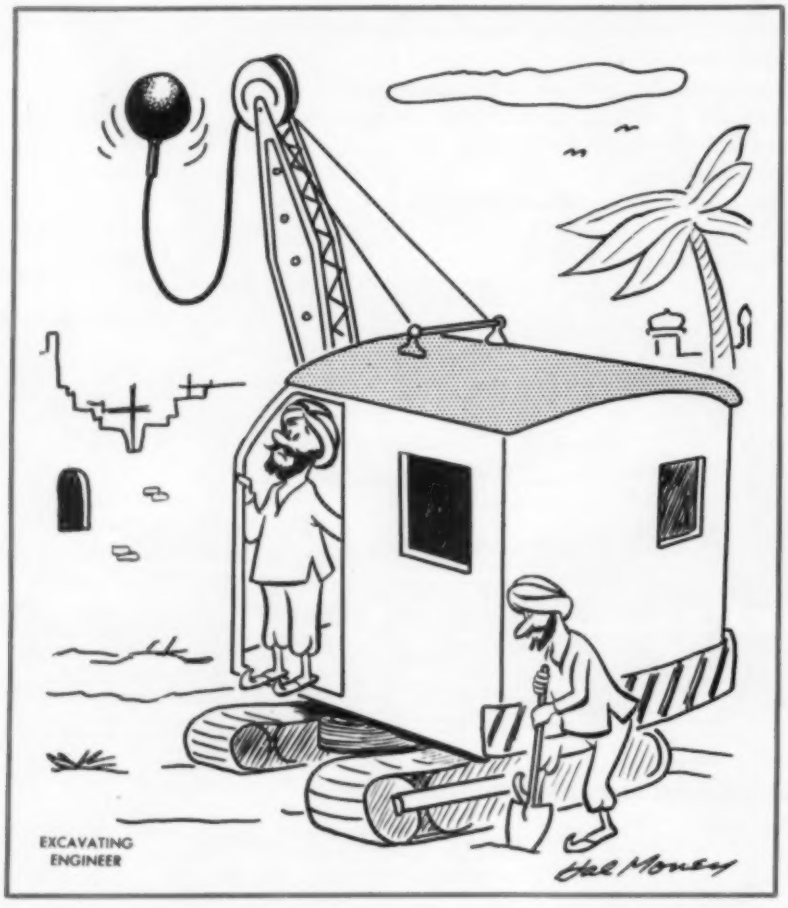
Each of the 24-volt systems now includes as standard equipment two ether starting aids and the necessary tubing to inject vaporized ether into the air intake manifold.

The use of the ether starting aids in conjunction with the glow plugs which have been successfully used in Caterpillar direct electric starting systems for some time makes it possible to start without difficulty in temperatures as low as 10°F.

Caterpillar has announced the production of new high-output hot water heaters as attachments for the No. 12, 112 and 212 motor graders.

Each of the heaters is equipped with two individually controlled blower fans capable of providing an air output of 620 cfm. Rated capacity of the new units is approximately 2½ times that of the small single-fan heaters previously used.

The heaters may be ordered to match either 6 or 24-volt electrical systems.



Hensley Tractor Parts

Manufacturer: Hensley Equipment Co., Inc., 800 Peralta Ave., San Leandro, Calif.

Claims: Hensley is producing three new improved tractor parts—rock guards, weld-on sprocket rims and grouser pads.

Built to protect roller tracks against excessive rock damage, the rock guards are made of extra heavy-duty selected steel. They are jig-fitted for easy installation and come in three sections to permit removal of any section for servicing rollers. They are heavily ribbed at points of stress and strain.

The weld-on sprocket rims feature indefinite use of the same hubs, with rims easily replaced when needed. They are fabricated of moly-manganese-chrome steel tempered to a controlled hardness. The Hensley specification steel welds easily when pre-heated, using any low-hydrogen welding rod.

The grouser pads are designed to fit

Continued on page 62

why gamble on point performance?

insist on — ESCO —

TESTED POINTS

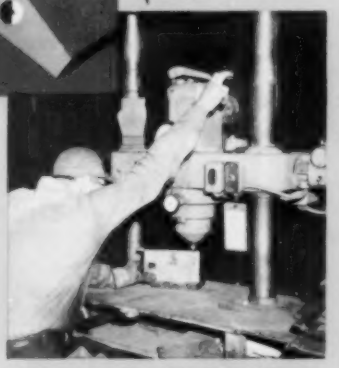
for...

- DRAGLINES
- DIPPERS
- HOE DIPPERS
- CLAMSHELLS
- FRONT END LOADERS
- DOZER ROOTER
- RIPPERS

look for this mark
of uniform high quality
on every ESCO point...

Every ESCO Point is individually tested for faster digging and longer life.

Now you can increase yardage and get lower cost per yard on all your jobs with *ESCO Tested* Points. Self-sharpening *ESCO* Points are cast of special *ESCO* 12M*, heat-treated for shock absorbing toughness and then *individually Brinell tested* to be sure they have exactly the right degree of abrasion-resisting hardness for faster digging and longer life. Stop taking chances on point performance, start using *ESCO Tested* Points today.



Operator using Brinell hardness testing machine to be sure each *ESCO* point has exactly the correct degree of hardness needed for faster digging and longer life. This close control is your guarantee of consistently superior performance on your job.

*Write for details on ESCO 12M.

ESCO

ELECTRIC STEEL FOUNDRY COMPANY

Manufacturing Plants
2143 N.W. 25th Ave.
Portland 10, Oregon
712 Porter St.
Danville, Illinois

ESCO International—New York Office
at 420 Lexington Ave., New York City, or
Portland Manufacturing Plant

Other Offices and Warehouses
Los Angeles, San Francisco, Calif.
Seattle, Spokane, Wash.
Centralia, Pa.
Houston, Texas
Eugene, Ore.
Salt Lake City, Utah
Honolulu, Hawaii

In Canada, Vancouver, British Columbia and Toronto, Ontario

THE RIGHT POINT SHAPE

will INCREASE your PROFITS!

PUT MORE PROFIT IN EVERY PASS—select the *right* point shape for your particular digging condition. There's an *ESCO* point shape to give maximum digging efficiency in *any* kind of work. You choose from seven shapes—ten different sizes. No other point manufacturer offers such a complete selection.

Use the *right ESCO* point shape for your job—on your dragline, dipper, hoe dipper, clamshell, front loader, ripper or dredge. Try several shapes—see which gives you the best results. Your *ESCO* dealer has them all in stock. He'll be happy to give you details.

ESCO

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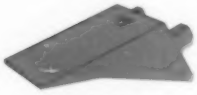
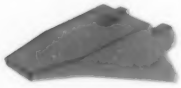
Seattle, Spokane, Wash.
Centralia, Pa.
Houston, Texas
Eugene, Ore.
Salt Lake City, Utah
Honolulu, Hawaii
In Canada, Vancouver, British Columbia and Toronto, Ontario

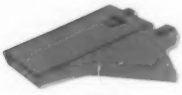
ESCO

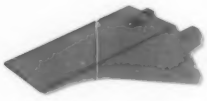
OFFERS YOU A POINT SHAPE FOR EVERY DIGGING CONDITION

GENERAL PURPOSE

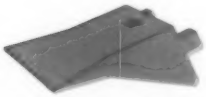

SHARP


PICK


ROCK


SHARP LONG

PICK ROCK


SHARP FLARED

You get more dig for your money with ESCO Tested Points because they *sharpen as they work.*

All-round Dirt-Moving Team

for low-cost operation

LARGE ENOUGH to get jobs done fast—
SMALL ENOUGH for profitable use on low-yardage jobs

HD-11 crawler—75 drawbar hp. Gets more work done faster and at lower cost with these on-the-job advantages: shock-absorbing, all-steel, box-A main frame; rugged final drives that ride on straddle-mounted roller bearings; 1,000-hour lubrication intervals for truck wheels, idlers and support rollers; ceramic-lined master clutch that requires fewer adjustments, provides extra long life; plus new operator convenience that includes a big foam rubber seat and 24-volt direct electric starting.

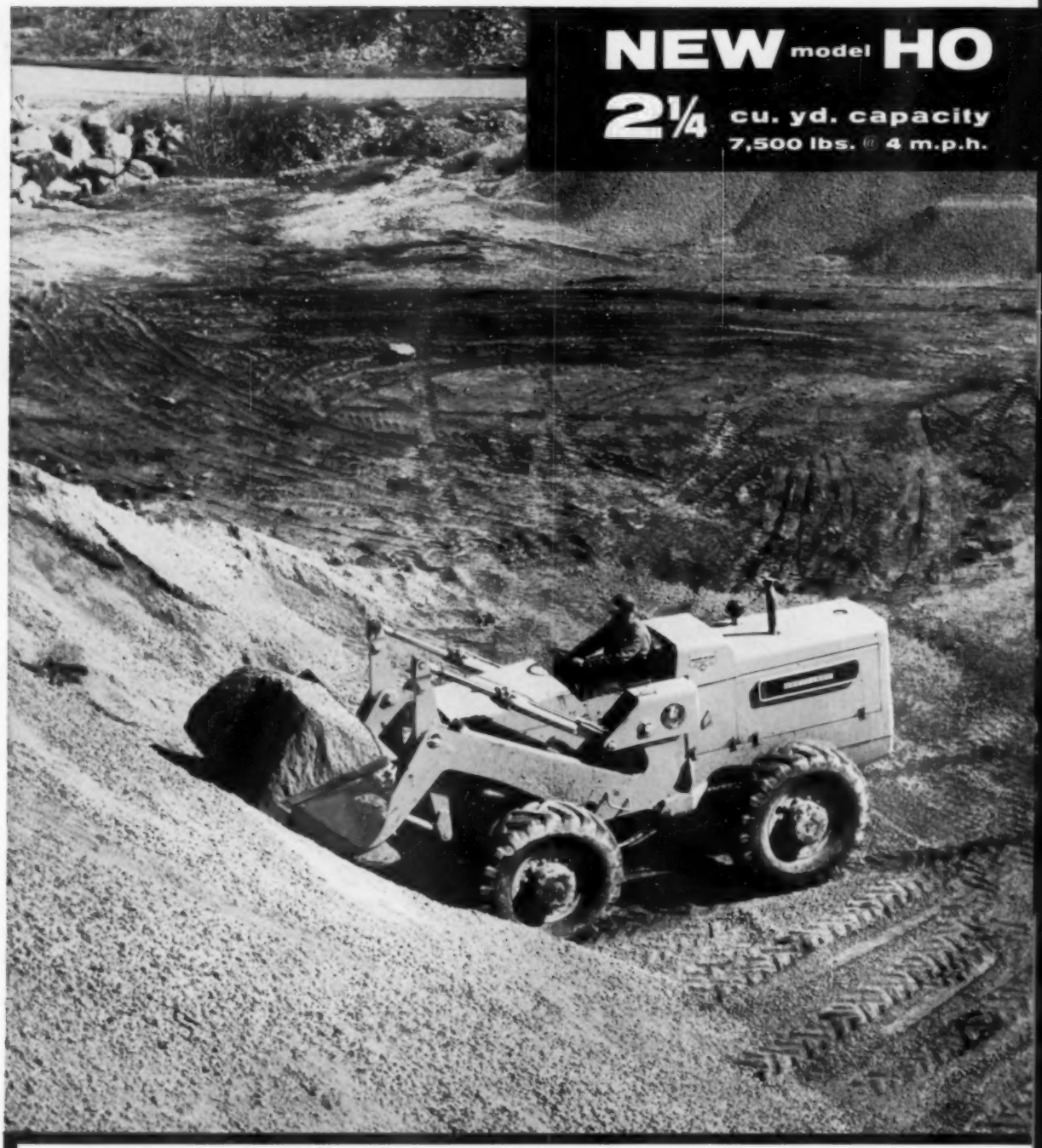
AC-106 scraper—6.1 yd struck, 7.5 yd heaped. Plenty of features for fast, low-cost dirt moving: curved, offset cutting edge and "center-boiling" loading action; wide, low bowl to keep center of gravity low; high-flotation tires and ample ground clearance; maximum stability for working on slopes or rough terrain; 81-in. apron opening and forward-forced ejection for quick, clean dumping; easy adjustments; simple sheave system.

• • •

See these and other important earth-moving advantages of Allis-Chalmers crawler tractor and scraper combinations at your Allis-Chalmers construction machinery dealer. He has complete facilities to serve you—factory-trained servicemen, factory-approved methods and complete stocks of True Original Parts.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS



Gets MORE Keeps MORE Delivers MORE

More Productive Capacity

It's the yardage a tractor-shovel delivers per hour or per shift that counts, and that is why the big new model HO "PAYLOADER" is outstanding. Pound for pound it's way ahead of the field in digging power, in maneuvering speed, in carrying capacity. It *gets more* load because of the pry-out and 40 degree tip-back bucket action — it *keeps more* (less spillage) while carrying because of the shock-absorber cushioning of the bucket — and it *delivers more.*

It operates easier, rides smoother — with or without a load — than anything near its size. It has balanced design and durability *throughout* to work for you day after day without interruption. If you want big *productive* capacity you want this big model HO.

HOUGH Design . . . Quality . . . Value

Digging power: Pound for pound, this "PAYLOADER" has more traction and digging power — for a wider range of ground conditions — than any wheeled tractor-shovel ever built.

Less slippage: New, exclusive feature — torque-proportioning differentials — reduce slipping, give better traction. Up to 24% more torque is automatically transferred to the wheel with best traction.

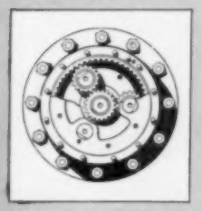
Hydraulic shock absorber: A shock absorber in the hydraulic system smooths out the ride, permits faster load-carrying speeds over rough terrain — with less spillage.

More production, less effort: Power-steer, power brakes (on all 4 wheels), power shift (no "clutching") and good riding qualities also lessen operator fatigue — promote full production all day.

Stay-clean hydraulic system: The hydraulic system is closed and pressure-controlled to keep air and dirt out — reduces oil foaming, lessens trouble and prolongs life of all hydraulic system parts.

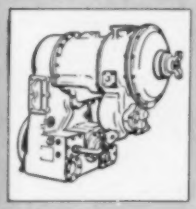
Long-life, high-traction drive train

Torque-proportioning differentials, an exclusive feature, assure effective traction under slipping conditions. If one wheel starts to slip, more power is delivered to the opposite wheel. Rugged planetary final drives in the wheel hubs, plus hypoid differential gearing, keep torque low in axles . . . prolong life of axles and all drive train parts.



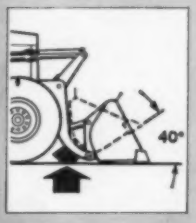
Complete Power-shift Transmission

The fastest and easiest-operating transmission you've ever seen. All shifts can be made instantly on-the-go, under full engine speed. There's no stopping for a RANGE shift, there's no foot clutch. With the forward-reverse control, the operator can "creep" the machine at full engine speed, in any gear, while maintaining full bucket action . . . all this, plus torque converter drive.



Tremendous pry-out action and 40° tip-back at ground level

Special pads are provided on the bottom of the boom arms to give ground support for powerful pry-out action. Load forces are also absorbed by the pads, relieving the axles and wheels of these strains. The bucket can tip back 40 degrees, before raising, to get heaped loads even in shallow cuts and low piles and to retain heaped loads.



If you want the last word in tractor-shovel performance on your jobs, you'll want the big HO or a smaller 4-wheel-drive "PAYLOADER".

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
708 Sunnyside Ave., Libertyville, Ill.

Send full information on "PAYLOADER" 4-wheel-drive tractor-shovels.

☐ model HO-2¼ cu. yd. ☐ model HH-1½ cu. yd. ☐ model HU-1 cu. yd.

Name_____

Title_____

Company_____

Street_____

City_____ State_____

New Equipment . . .

Continued from page 56

Caterpillar D7 and D8, Allis-Chalmers HD-19 and HD-20, and International Harvester TD-24 tractors. The pads are made of special alloy steel and are precision jig-drilled for easy installation. No drift pin fitting is necessary. The counter-sunk bolt holes permit use of the original bolts when replacing the rails.

Heavy Marion Crane

Manufacturer: Marion Power Shovel Co., Marion, Ohio.

Claims: Marion has begun production on the 87-M, a low-slung crawler-mounted unit designed and built specifically for heavy-lifting crane work.

Design features include extra-wide crawlers; alloy steel lower frame, axles and crawler frames; double hook rollers; and a third drum that can be used for either auxiliary work or as a high-speed boom hoist.

A special heavy-duty crane boom, with open throat point section, will handle the maximum rated capacity of the machine—75 tons. Deep center sections with tapered extensions are available for long boom work.

The third drum is mounted on the head shaft of the low gantry and is driven by the crowd retract clutch through an intermediate shaft and chain drive. A spring-set air released brake and a ratchet and pawl are incorporated in the unit. The third drum also can be

equipped with a reversing clutch to obtain power up, power down control for boom hoisting. When using the third drum as a boom hoist, one end of the boom hoist cable can be dead-ended to the standard worm-driven boom hoist with the other end attached to the third drum for high speed operation.

The basic rating of the machine is 75 tons at 12-ft. radius with a 50-ft. boom. Other typical ratings are as follows: 63 tons at 18-ft. radius with a 70-ft. boom; 30 tons at 30-ft. radius with a 70-ft. boom; 17 tons at 45-ft. radius with a 100-ft. boom; and 10½ tons at 60-ft. radius with a 140-ft. boom.

For specific work requirements, the boom can be fitted with either a 15 or 30-ft. primary jib.

Improved I-H Crawlers

Manufacturer: International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Claims: Engineering improvements have been made on International's new crawler tractor line of four models: the TD-18, TD-14, TD-9 and TD-6.

Principal engineering changes in the new models are substantially increased horsepower ratings in the TD-6, TD-9 and TD-14; the "new look"; better operator visibility; Cerametallic clutch facings; pressurized covering systems; 500-hour track roller seals; and all-weather, positive, easy-starting conversion systems.

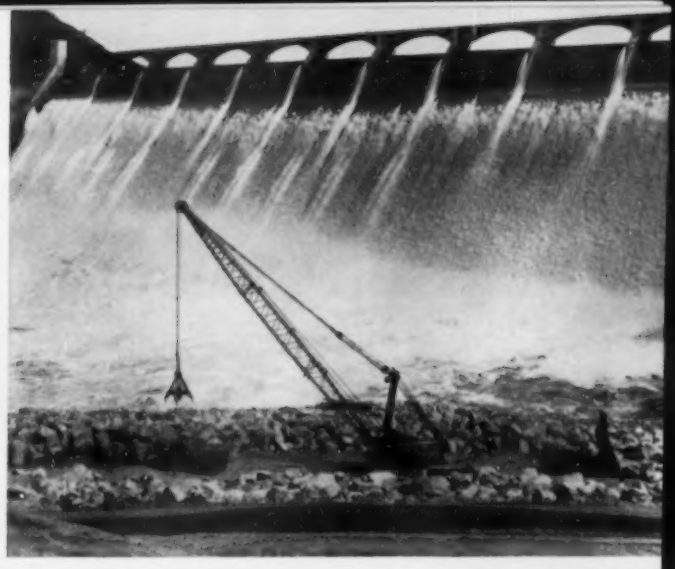
The TD-6 is rated at 41.5 hp. Matching the increase in horsepower output is a strengthened power train. The TD-6 has the new Cerametallic clutch facing, which is composed of heat-resisting material similar to that used as brake linings on jet aircraft.

The radiator grille and hood assembly of the TD-6 has been raised 3½ inches. The hood, which tapers gently to the operator's seat, gives a clear view of all front-end operations. Operator comfort has been improved by providing a wide, roomy seat padded with thick foam rubber. The deck of the platform has been provided with non-skid steel. The platform is flush and open for greater leg room and better air circulation.

Instruments have been grouped to-

Continued on page 66

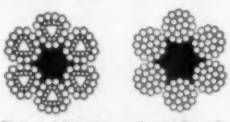
"Remember, you're to find me a new home, and I get to set off the first charge."



PROVING EXTRAORDINARY SERVICE—A Hercules Flattened Strand crane rope delivered 18 months service, compared to 6 months for ordinary rope. It performed equally well as a clamshell bucket rope. On a hot ladle crane it outlasted round strand rope by 4 to 1, and still tested at higher-than-rated strength. It was chosen for its super strength to haul the car on the continent's largest cableway at Kitimat.

Can Flattened Strand solve your special wire rope problem?

Hercules Flattened Strand is a special kind of wire rope that provides extraordinary service on special kinds of jobs.



Flattened Strand Round Strand

The key to the difference is the triangular shape of the strands. Notice how the strands support each other; how the rope circumference is almost perfectly round; and how the core is smaller. There is 10% more steel in Hercules Flattened Strand than in round strand ropes of the same diameter. That means *10% more strength* and *10% greater safety*. Flattened Strand wears longer and more evenly . . . and is easier on sheaves and equipment.

If you can use this Super-rope, you'll soon begin saving time, labor, money. Why not investigate?

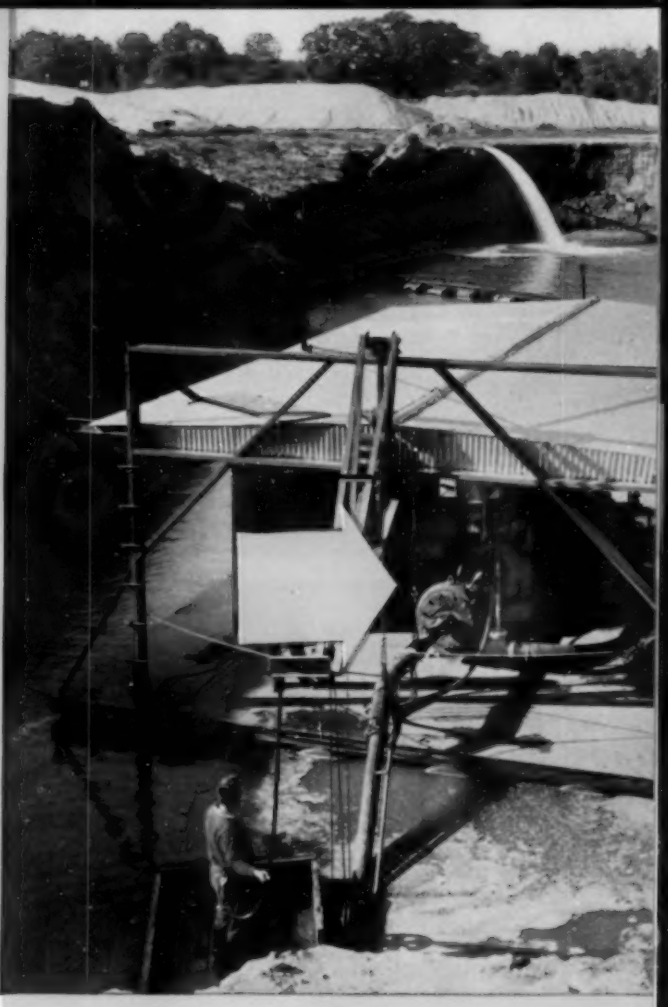
Because Leschen pioneered and perfected Hercules Flattened Strand wire rope, Leschen is your best source of additional information. Ask your Leschen man, or write for "The Flattened Strand Story."

LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.
St. Louis 12, Missouri

LESCHEN
HERCULES *Red-Strand*®
WIRE ROPE
HKP

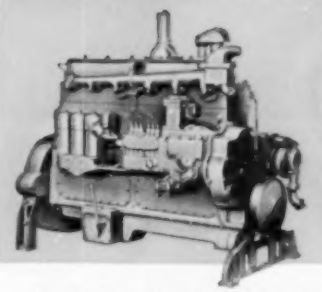
PROOF OF PERFORMANCE!

After 8 years' experience with a D13000, "nothing but another Caterpillar Engine" was considered by the Wenonah Sand & Gravel Co. for its second dredge



This CAT* D13000 Engine drives a 6" pump in a hydraulic sand dredge, operated by the Wenonah Sand & Gravel Co., Wenonah, N. J. There's a 70-foot lift through 600 feet of pipe to the wash tower. The engine, purchased several years ago, is the company's second D13000. According to Earl T. Kroll, Chief Mechanic, here's why: "Having used a duplicate of this engine in another dredge since 1946 with unquestioned economy and reliability, when we wanted to put another dredge into service, there was nothing but another Caterpillar Engine for us, a choice we haven't regretted."

This is just one of thousands of cases where the performance of one Caterpillar Diesel has sold another. There's a reason. These rugged units, available up to 650 HP (maximum), pay off in dollars and cents *on the job*. Simple to operate, they need a minimum of attention and maintenance. And they're sturdily built for a long life of low-cost use in *every* type of construction equipment. What's more, your Caterpillar Dealer stands back of them with prompt, capable service whenever and wherever it's needed!



NOW IN THE CAT POWER LINE-UP: THE NEW D342, AN EVEN MORE EFFICIENT UNIT!

Replacing the D13000, the more powerful, more compact 6-cylinder D342 delivers 210 HP (maximum). And with Caterpillar 4-cycle design, the fuel system requires no adjustment and there are no air boxes or cylinder ports to clean. Your maintenance is reduced to a few minutes a month for oil and filter changes. For complete information about this and other modern heavy-duty engines, see your Caterpillar Dealer.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

MODERN HEAVY-DUTY DIESEL POWER

NOT in the Contract

A group of prohibitionists looking for evidence of the healthfulness of total abstinence were told of an old man of 90 who had never touched a drop of liquor. So they rushed to his home to get a statement.

After propping him up in bed and guiding his feeble hand along the dotted line, they heard a violent disturbance outside—scuffling feet, furniture falling and smashing dishes.

"Good heavens, what's that?" gasped a committeeman.

"Oh," whispered the old man as he fell exhausted into his pillows, "that's paw. He's drunk again."

Traffic cop: "Use your noodle, lady. Use your noodle!"

Lady: "My goodness. Where is it? I've pushed and pulled everything in the car."

A woman bought a $300 suit at Hattie Carnegie's and was appalled to see what appeared to be her suit at Ohrbach's for $32.50. She rushed right back to Carnegie's and told them about it.

"But, Madam," said the saleswoman, "the Ohrbach copy probably wasn't 100% virgin wool."

"At these prices I should care what the sheep do at night?" screamed the customer.

Professor: "I will not begin today's lecture until the room settles down."

Voice from the rear: "Go home and sleep it off."

The members of a hunting party had been specifically requested to bring only male hounds. One indigent member, however, owned only a female, and out of courtesy was finally permitted to include her. The pack was off in a flash. In a matter of seconds they were completely out of sight. The confused hunters stopped to question a farmer in a nearby field, "Did you see some hounds go by here?"

"Yep," said the farmer.

"See where they went?"

"Nope," was the reply, "but it was the first time I ever seen a fox running fifth!"

Judge: "Now, Sir, you may, if you wish, challenge any member of the jury."

Prisoner: "Well, I'm not in very good condition, but I believe I can lick that little guy in the end seat."

A small contractor and his partner closed their office at noon one Saturday and went to the movies. When they were seated, one of them nudged the other and gasped, "Gosh, Joe, we forgot to close the safe!"

"What's the difference?" asked the other. "We're both here, ain't we?"

Two elderly American ladies were journeying across Canada for the first time. In the West, the train stopped in a large station and they got out for a walk. Meeting a man on the platform, one asked, "What place is this?" The man said, "Saskatoon, Saskatchewan." The lady, thrilled, turned to her companion and whispered, "They don't speak English here!"

A farmer was driving past an insane asylum with a load of fertilizer when an inmate called to him:

"What are you hauling there?"

"Fertilizer," replied the farmer.

"What are you going to do with it?"

"Put it on strawberries."

"You ought to live here. We get sugar and cream on ours."

Ed: "I guess you've been out with worse looking fellows than me?"

Susie: No answer.

Ed: "I say, I guess you've been out with worse looking fellows than me?"

Susie: "I heard you the first time. I was just trying to think."

Customer: "Does Smith drink much?"

Bartender: "Yes, he's one of our unsteadiest customers."

"Grand Coulee," yelled the devout man as he hit his finger with the hammer.

"What do you mean by yelling 'Grand Coulee'?" asked his wife.

"That," he replied, "is the world's largest dam, isn't it?"

"So does that cabbage you're cooking, Mrs. Stoll!"

New Equipment . . .

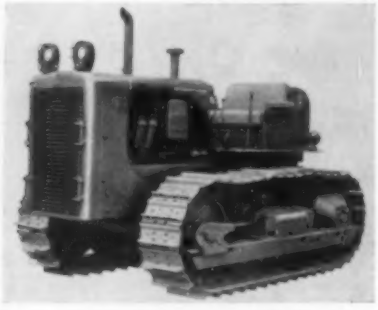
Continued from page 62

gether in the center of the dashboard. Steering control levers have been redesigned with spring boosters, reducing lever pull by more than 25% over previous models. All-weather electric starting is standard equipment.

The TD-9 is being produced with a 54.5 drawbar hp. Belt horsepower has been increased to 66.

The TD-9 also uses the Cerametallic clutch facings. Improved visibility also results from streamlining. Operating controls are readily accessible to the operator. The foldover seat facilitates servicing of steering clutch assemblies.

The drawbar horsepower on the TD-14 has been increased to 78.5. Belt horsepower has been upped to 89.5. Like the TD-6 and TD-9, the TD-14 has Cerametallic clutch facings, better operating facilities, new hydraulic steering clutch boosters and streamlined appearance.



The most outstanding engineering changes on the TD-18 (pictured) are new 500-hour track roller seals, heavier radiator guards and improved streamlined appearance. International's gasoline-conversion, electric starting system is provided as standard equipment. The TD-18 also features as standard equipment the Cerametallic clutch. Lubrication of the steering clutch assemblies also has been centralized. Pressurized cooling is provided. The TD-18 produces 124 hp at 1,450 rpm. The drawbar pull is 24,300 pounds. Drawbar horsepower is 103.

800-amp G-E Welder

Manufacturer: General Electric Co., Schenectady 5, N. Y.

Claims: General Electric has announced a new 800-ampere rectifier welder for gas-shielded, consumable electrode welding.

Available in three models to meet

varying application requirements, the welder features quiet operation, a combination cleaning-cooling fan, easily removable side covers and Class H silicone insulation. An infinite number of welding voltages within the unit's rating will suit any condition of gas and size and speed of wire, company engineers say.

The basic unit is designed for hand adjustment of arc voltage by means of an adjustable autotransformer.

The regulated constant potential model has all the features of the basic unit, plus automatic adjustment for line voltage fluctuations. Other features of the regulated constant potential model include independent voltage control for flexible starting characteristics, a plug-in control circuit for simplified maintenance and an external control panel that can be removed and attached to an extension for remote operation.

In addition to the features common to the regulated constant potential model, the Fillerarc model is designed with a circuit that gives a rising volt-ampere characteristic and produces a slope that maintains constant arc length. The Fillerarc offers an infinite number of rising slopes applicable for any gas and electrode combination. It is suitable for crater filling, holds constant arc length and virtually eliminates the risk of burnback.

(The General Electric process for consumable electrode gas-shielded welding consists of three main components, including a gun, a wire drive and power source.)

All three models are rated at 800-ampere output, 15 to 40 volts continuous; 95% power factor; 78% efficiency and 41-kilowatt input. They weigh approximately 620 pounds and are 44 inches high, 31 inches wide and 26 inches deep.

Joint Sealer

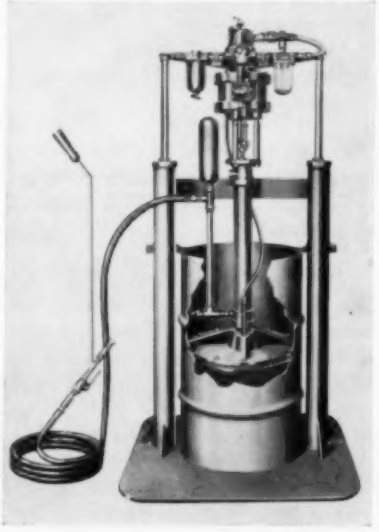
Manufacturer: Clipper Mfg. Co., 2800 Warwick St., Kansas City 8, Mo.

Claims: The Clipper CP-400 joint sealer is a low-cost, ready-to-use unit for applying cold sealing compounds.

It consists basically of two vertical air cylinders which straddle a 55-gal. material drum. The cylinders are connected at the top by a crossbeam which supports an air pump. The lower extension of this pump is attached to a drum wiper plate which enters the material drum.

In operation, the two cylinders raise the pump and drum wiper plate. The material drum is placed between two cylinders and the drum wiper plate is lowered into the drum. The drum wiper plate does not "push" the material, but serves to maintain an even level of sealing material which is pumped out of the drum by the air pump.

The air pump consists of a 6-in. diameter air cylinder and a piston which is made to move up and down by an automatic air valve. An air pump extension is connected to a foot valve which in turn is attached to the drum wiper plate. When the piston in the air pump goes up, material is scooped into the foot valve. On the down stroke of the air piston, the material is prevented from going back into the drum by a check valve, and is instead forced out through the material hose, the applicator bar and nozzle into the joint.



In Nevada...And the World Over

Bucyrus-Eries get down to paydirt FAST

IN open-pit mines everywhere, Bucyrus-Erie shovels like this 6-yd. 150-B are demonstrating their ability to strip overburden and load ore fast and economically.

You can see *how* they do this as you watch them work — heaped dippers, smooth cycles, ease of control that cuts operator fatigue, plus year-after-year dependability.

You can see *why* Bucyrus-Eries are superior performers when you check their design and construction. The strong yet light front end reduces deadweight, saves power. Ward Leonard electric control provides immediate response, permits time-saving coordination.

We would be glad to tell you more about Bucyrus-Erie excavators — how they can improve *your* operations.

97L56C

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

Workman tamps charge in blast hole, while drills in background put down more holes. Roger Badgett estimates that 65% of the excavation in his two sections is rock.

eight interchanges. Starting from the South, they are:

Landsdale, connecting with state Route 63; Quakertown, connecting with state Route 663; Lehigh Valley, connecting with U. S. Route 22; Mahoning Valley, connecting with U. S. Route 209; Pocono, connecting with state Route 940; Wilkes-Barre, connecting with state Route 115; Wyoming Valley, connecting with U. S. Route 315; and Scranton, connecting with U. S. Routes 6 and 11.

Quantities Estimated

Turnpike engineers estimate that nearly 70,000 tons of steel will be required for the Extension. Materials estimates include:

Cement, 2,971,295 barrels; fine aggregate, 714,207 tons; course aggregate, 1,782,526 tons; subgrade requirements, 1,254,775 cubic yards; fabricated structural steel 81,440,047 pounds; reinforced steel bars, 30,793,474 pounds; carbon steel paving mesh, 25,868,851 pounds; and carbon steel joint assemblies, 2,279,000 pounds.

The Pennsylvania Turnpike Commission proudly refers to its turnpike as "The World's Greatest Highway."

G. Franklin McSorley is chairman of the Turnpike Commission. David E. Watson, James F. Torrance and Joseph J. Lawler are members.

Turnpike . . .

Continued from page 47

.4 mile: Substructure, L. & H. Construction Co., Bethlehem, Pa., $738,225; Superstructure, Bethlehem Steel Co., Philadelphia, Pa., $2,517,673.95.

2 and 3. Lehigh River Bridge, North Crossing (.113 mile), and Hawk Falls Bridge (.170 mile), Carbon and Luzerne counties: Substructures for both, Lycoming Construction Co., Williamsport, Pa., $374,099.20; Superstructures for both, Bethlehem Steel Co., $1,539,-261.70.

4. Lackawanna River Bridge, Lackawanna County, .14 mile: Substructure, Brayman Construction Co., Pittsburgh, Pa., $320,769.25; Superstructure, Phoenix Bridge Co., Phoenixville, Pa., $849,-068.60.

5. Clark's Summit Bridge, Lackawanna County, .3 mile: Substructure, W. P. Dickerson & Son, Holidaysburg, Pa., $496,565.70; Superstructure, Phoenix Bridge Co., $1,652,384.90.

The Northeastern Extension will have

A LISTING of the contractors on the Northeastern Extension, including those who worked on the sections already opened, include (from the southern end):

Section	Miles	Contractor	Amount
35A	.67	C. J. Langenfelder & Son	$ 990,000.00
35B	4.29	Howard Worthington	3,108,594.62
35C	4.05	Marsolino Construction Co.	2,278,065.00
35D	4.34	James D. Morrissey, Inc.	3,473,751.07
35E	4.90	Latrobe Road Const. Co.	3,074,015.58
35F	5.06	C. J. Langenfelder & Son	3,148,648.50
35G	5.33	C. J. Langenfelder & Son	3,817,399.52
35H	4.10	C. J. Langenfelder & Son	2,862,426.05
35I	2.54	John H. Swanger, Inc.	1,388,573.89
36A	2.96	H. J. Williams Co., Inc.	3,334,253.07
36B & C	9.205	Lane Construction Co.	5,948,649.16
36D	3.59	H. J. Williams Co., Inc.	2,898,506.13
36E	2.73	Central Pa. Quarry Stripping & Const. Co.	2,563,168.05
36G	4.07	Central Pa. Quarry Stripping & Const. Co.	3,799,071.89
36H	5.83	J. Robert Bazley, Inc.	4,021,269.45
37A	3.95	J. Robert Bazley, Inc.	2,375,066.40
37B	4.41	Badgett Mine Stripping	2,388,986.35
37C	2.90	Central Pa. Quarry Stripping & Const. Co.	1,953,032.49
37D	3.63	Lycoming Const. Co.	2,110,622.49
37E	6.62	Lycoming Const. Co.	3,068,362.75
37F & G	7.30	Badgett Mine Stripping	5,488,529.54
37H	2.11	W. E. Graham & Son	1,760,357.68
37I	2.87	Gasparini Excavating Co.	2,102,632.39
37J	3.54	George M. Brewster & Son	3,722,873.10
37K	4.53	George M. Brewster & Son	3,562,949.34
37L	4.53	Latrobe Road Const. Co.	3,678,391.20
37N	.57	Ryan Bros., Inc.	1,097,860.75

Constructs access roads

Builds interchanges

Backfills around buildings

A place on every dirtmoving job

Every "big" dirtmoving job breaks down into work sections . . . some suitable for "big" equipment . . . some for "small" equipment.

The versatile 138 hp D Tournapull fills the need for a fast, flexible, scraper which works economically on both big and small-yardage assignments, on both long and short hauls.

Because the D Tournapull can self-load up to 5 yds., it can be used as a one-man crew for pioneer and clean-up assignments. It frequently handles advance grading of haul roads, stripping, and stockpiling of topsoil, leveling of land, opening preliminary drainage along right-of-way, and similar jobs.

After your production fleet is moved out, "D" stays behind to:

1. fine-grade between forms
2. build access roads
3. connect driveways
4. grade shoulders
5. spread gravel and topsoil
6. backfill around culverts
7. shape backslopes
8. level borrow pits
9. open drainage ditches
10. load and spread top soil — and perform dozens of other odd jobs in addition to those listed above.

Because of "D's" ability to make quick moves, work in any combination of unit assignments, with productive capacity to handle these necessary small and scattered jobs at high-speed . . . D Tournapull reduces delays and expense that would otherwise eat into profits.

When "D" runs out of odd-job assignments, it fills in well with any combination of push-loaded production equipment. Its 7½-cu. yd. capacity plus high-speed cycle makes "D's" production worthwhile. Quick loading and dumping, easy maneuverability, and speeds to 28 mph, enable the "D" to equal and often outperform larger capacity production dirtmovers.

Combining this profitable production capacity with ability to materially cut time and expense on clean-up and odd job assignments makes "D" well worth investigating as a "one-man handyman" on any size project.

Also, remember that the "D" can pick up substantial extra profits for you by doing small hourly-rate or by-the-job contract work between assignments on your major contract.

Ask your LeTourneau-Westinghouse Distributor for owner-verified facts on D Tournapull performance on big and small jobs. Check for yourself how the "D", added to your fleet, will help you make bigger profits.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-972-G-b

Loads boulders, stumps

Cuts drainage ditches

Grades shoulders

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Phosphate . . .

Continued from page 29

a less soluble material, drifted along and became concentrated.

The result is a five-billion-ton deposit of phosphate rock, 19% of the total world supply. At the present rate of mining, there is enough high-grade phosphate rock in this area to last for 300 years—and enough low-grade rock to last another 1,000. Phosphate is a chemical compound know as tri-calcium phosphate and called phosphorite. All of the rock mined in Polk County is in pebble form varying in diameter from one inch to a size small enough to pass through a screen cloth with more than 300 openings per lineal inch.

Discover Phosphate

Phosphate was first discovered in the United States in South Carolina about 1863. Exploitation of these fields was delayed until 1867 because of the Civil War. In 1888, the Florida fields were opened, and by 1906 western states had started production. In that day, mule-drawn scrapers removed the overburden; wheelbarrow and shovel mined the matrix. Today, the Florida phosphate companies employ about 5,000 persons, most of them residents of the two counties in which they work—Polk and Hillsboro.

The uses of phosphate are as varied as the degrees of darkness from night to day. A deadly poison in one form, phosphate is also a constituent of foods which promote good health. Elemental phosphorus, the poisonous form, is made in an electric furnace and collected under water because in the air it catches fire spontaneously. A few grains taken internally will cause death, and a burn from it is severe. In wartime it is used in mortar shells and incendiary bombs.

On the other hand, a mild phosphate acid obtained by the removal of dangerous properties, is used in the manufacture of baking powder, soft drinks, marmalades, drugs, water softeners, soaps, and animal food to counteract a dietary deficiency. Every day we use phosphate or phosphate derivatives to serve a multitude of uses.

Mosquitos and other insects are controlled by a product which contains elemental phosphorus. To produce an image, the picture tube of a TV set needs potash phosphate and feldspar. Hay fever sufferers find relief with a phosphate drug called TPN. Some of the best roasts owe their taste to 20-FOS fed to cattle during their growing period. And the fire that cooked that roast may have been kindled from a match containing elemental phosphorus. If you finish off that meal with a cake, you can attribute its light texture to baking powder which contains as a basic ingredient, monocalcium phosphate.

Phosphorus has no substitute. Without this essential element, neither plant nor animal life could exist. Although there are many sources of nitrogen and other elements vital to plant growth, the only known primary source of phosphorus is phosphate rock. In 1954, Florida phosphate fields produced 9,166,855 tons of this important rock. It sold for a record-breaking $55,612,272. Seventy three per cent was consumed for agricultural purposes, and eight for industrial uses. The remaining 19% went to foreign markets. Phosphate mining is truly one of the nation's vital industries.

Blue Diamond . . .

Continued from page 37

evitable, factory parts are brought in for the job and installed by trained mechanics.

One of the roughest and ever-continuing equipment maintenance problems is hardfacing to resist shock abrasion and normal wear. As an indication of the scope of this work, there are two General Electric and one 300-amp Lincoln diesel-driven machine available for hardfacing. Welding rod is standardized on three types. Jetweld rods in ¼ and $\frac{5}{32}$-in. sizes are being used almost exclusively for building up the gauge on square drill steel stems for the Joy drill. This rod, which practically welds by itself, has the advantage of going on rapidly. A good welder can apply about 50 pounds in an ordinary 8-hour shift. For abrasive wear on crawler tracks and sprockets, Lincoln Wearwell rod is being used. This rod has the advantage of going on heavy or thin depending on the distance the rod is held from the part to be hardfaced.

According to J. J. Holton, the head welder, layers as thin as $\frac{1}{16}$-in. can be built with material because of its jetting or spraying action when the rod is held farther out from the hardfacing unit. A third arc rod—Stoody 21—is being used wherever shock abrasion is a factor. This is true for dipper teeth on shovels. Stoody 21 is being used exclusively for the buildup of shovel teeth, sometimes prior to the time they are placed in service.

Other points of the preventive main-

Continued on page 72

"Yeah, I'm a newlywed. Wanna make something of it?"

Four-wheel drive, and tires 2' wide, give Tournatractor ample traction to make full use of its 208 hp.

Root-Rakes

Here's what high-speed on rubber can do for you

Tournatractor, with 19 mph forward speed and 8 mph reverse speed, can do many tractor jobs twice as fast as a crawler-tractor.

Drives anywhere

Because of its big low-pressure tires, Tournatractor drives anywhere under its own power. Job-to-job moves can be made across pavement, over curbs, sidewalks, and railroad tracks. On long moves it saves time, bother, and expense of locating a trailer, moving in extra manpower and transport equipment, loading and unloading.

Reduces maintenance

Tournatractor greatly reduces maintenance and service costs by eliminating some 500 wearing parts that grind through dirt in a crawler-track assembly. Eliminated also is the friction caused by grit-grinding in the track assembly which reduces rated horsepower.

Easy to operate

With simple, easy-to-handle, power controls, and comfortable, adjustable, foam-rubber seat, operator on Tournatractor works comfortably, with less fatigue, maneuvers faster, gets more work done, in less time, with less effort.

High-speed performance

Constant-mesh transmission eliminates delays in changing gears... saves vital momentum... gives any gear-ratio instantly. As a pusher or dozer, Tournatractor high-speed reverse (up to 8 mph) is a very important time saver.

Versatility helps get more work done

Wide range of attachments increase Tournatractor range of applications, extend length of work season. Since Tournatractor is a "traveling man", these optional attachments are especially important in finding profitable jobs in a wide range of big or small industries and in any climate or area selected.

a. Equipped with Bulldozer or Angledozer blade, Tournatractor push-loads scrapers, moves short-haul dirt, cle..ns up at shovel, loads and spreads on dump, digs drainage ditches, maintains haul roads, clears land, terraces, digs stock piles, grades roads. Does all these jobs fast.

b. Root-Rake makes 208 hp Tournatractor a powerful tool for clearing brush, grubbing roots, raking out boulders, etc. The 11'4" wide x 4'6" high rake has 10 teeth of 4" high-grade steel, to resist shock, do heavy work.

c. Tree-pusher attached to Tournatractor, reaches high on tree with 32' forked boom, provides extra leverage to push trees down fast. Boom angle creates down-pressure on tires, increases traction, helps remove more trees in less time.

d. Tournatractor with drawbar attachments does wide variety of chores—keeps working at 100% availability. Pulls scrapers, sheepsfoot rollers, rooters, and other drawn equipment.

Ask for owner-verified job reports on work similar to yours.

Tree-pusher

Tournatractor, Angledozer, Rooter—Trademark Reg. U.S. Pat. Off. T-954-G-bw

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Got A Tough Digging Job?

● SOFT GROUND

● DEEP WATER

● NARROW SPACE

● STEEP HILLS

Use A Sauerman DragScraper

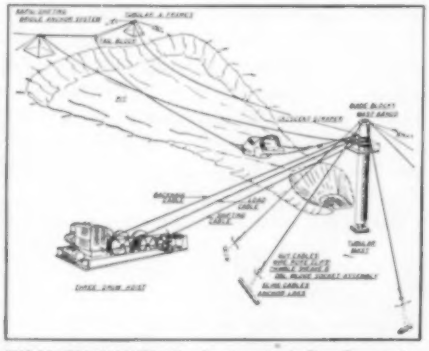
● **SOFT GROUND**—Sauerman DragScrapers work on surfaces where wheeled equipment cannot go and where mats are required to operate a dragline. The DragScraper digs and hauls its load quickly at ground level to hopper or pile. It carries a payload of two to three times its weight. You are not paying the power costs of a heavy machine with a handling capacity that is just a small portion of its weight.

● **NARROW SPACE**—A DragScraper can be operated through an opening no larger than the bucket's width. They are used successfully in culverts, sewers, tunnels, under bridges and buildings. Locations with limited space and head room . . . unworkable with other equipment . . . are handled efficiently and economically with a DragScraper.

● **DEEP WATER**—A Sauerman DragScraper will dig as much as 100 ft. below water . . . this is far below the safe depth that a dragline bucket can go without the danger of undermining and overturning the machine. Use a DragScraper for trenching, digging channels, lakes or for beach construction.

● **STEEP HILLS**—These are routine for a DragScraper. Material can be taken from anywhere on the bank. Digging from the top of the slope eliminates cave-ins—and the DragScraper gives an extra bonus by pushing additional material in front of the bucket on its way down the slope.

The Sauerman DragScraper operator and hoist is always located away from any hazardous area. It is designed for years of safe, continuous duty, handling bucket sizes up to 15-cu. yds. over spans to 1000 ft. or more.



THE SAUERMAN METHOD—*showing a basic DragScraper installation. Variations of this method are Sauerman engineered to handle the toughest digging jobs at the lowest cost per cu. yd.*

When you have a "tough-to-handle" job consult Sauerman engineers about Sauerman equipment and the Sauerman Method. Request Catalog A, also the Sauerman News and field reports.

SAUERMAN BROS., INC. 622 SO. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

Blue Diamond . . .

Continued from page 70

tenance system include regular routine mechanical inspections of all units, daily lubrication service by a mobile General Motors 6 x 6 truck which carries an Alemite pressure system, regular diesel fuel, automotive-grade diesel fuel and gasoline. The amount of air cleaner and oil filter service probably exceeds what is normal under most conditions, chiefly because of so much dust and hot weather through the summer months.

Expansion of the old gypsum diggings from the depression years to the modern industrial plant of the present time has had a very interesting by-product. It has created the town of Blue Diamond, Nev., complete with post office and other facilities typical of a small town. The village now has room for 24 company trailers, 71 attractive company houses, and an additional 55 trailer spaces for private use. In addition to these facilities, there are bunk houses for 90 single employees.

High Morale

Activities at the mine, the mill and the village have made for rare esprit de corps. This is a happy, close-knit group. Electric power is supplied by Southern Nevada Power Co. There is no water problem, thanks to drilled wells in the vicinity which have produced more water than the village can use. A 23-mile all-weather bituminous highway connects the project location with Las Vegas. The air-line clearance is wide open for television reception. During the worst summer months the houses use evaporative-type air coolers. During the fall, winter and spring months the climate is one of the most unusual to be found anywhere in the United States. It was near freezing at 7 a.m. on January 11—the day the project was visited—but by 10 a.m. the temperature had risen to the point where a jacket was uncomfortably warm. By noon it was a summery 80°.

Blue Diamond's Nevada operations are under the general supervision of H. L. Walthausen, works manager. He is assisted by Ed Gutneckht, plant superintendent; Dan Benton, plaster mill superintendent; and Floyd Day, maintenance superintendent. Officials at the mine in charge of excavation include M. C. Brooks, mine superintendent; J. H. Cain, assistant mine superintendent; and Mark West, maintenance superintendent.

Wide bowl-opening on Rear-Dump provides easy entry, big target for shovel, dragline, or conveyor loader. Units come in 11, 22, and 35-ton capacities.

Smooth, streamlined, unobstructed body dumping at 66° angle readily sheds sticky material.

Hauls to overburden dump are made at speeds up to 32 mph by this C Rear-Dump.

Big-tire haulers beat mud problem

A Canadian company had the problem of stripping 30 to 75-ft. layer of wet clay out of rock pockets. Soft and sticky with trapped-in moisture, this overburden was loaded by draglines, and hauled half a mile to waste dumps. Four C Tournapull Rear-Dumps were used to speed hauling.

Exceptional mud-ability

As owners everywhere have found, Tournapull Rear-Dumps go through mud which stops conventional truck-type haulers. On this overburden job, for example, these Rear-Dumps worked out of deep mud-holes in the pit and off dumps so soft a man could not walk through them. The exceptional mud-ability they showed is due partly to traction of big 21.00 x 25 low-pressure tires . . . partly to electric power-steer through geared kingpin which "walks" Tournapulls out of trouble . . . partly to exclusive differential which *automatically* transfers power from slipping wheel to wheel on firmer footing.

On rough haul-roads, Rear-Dumps with 5'6" diameter tires haul faster than trucks. The big tires grip and roll over the bumps, cushion machinery and operator from road shocks.

Turn around non-stop

These Rear-Dumps also work faster and with greater safety in narrow quarters than conventional haulers. They turn around in much less space. When bowl is raised, they shorten wheel-base to turn non-stop in an area about 1/3 less their overall length. This maneuverability speeds haul on narrow roads, reduces spotting time at shovel and dumps.

Dump fast and clean

Practically no clean-up is needed on the dump. With front-wheel drive, Rear-Dumps back safely to edge of bank. Bowl swings behind and below rear wheels . . . loads fall free and clear over the edge, with little spillage, seldom call for clean-up.

Ask your LeTourneau-Westinghouse Distributor to show you first-hand how Rear-Dump advantages can pay off on your work.

Rear-Dumps now available with optional tailgate.

Tournapull—Trademark Reg. U.S. Pat. Off. R-982-G-bw

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

"A CARLOAD EVERY 11 MINUTES WITH OUR ERIE STRAYER BUCKET"

REPORTS DEWEY SLOOP . . . SUPERINTENDENT FORREST PLANT, HOLLIDAY SAND & GRAVEL CO

Eleven minutes to load a 100,000-pound gondola with sand—less than an hour to fill a 215-ton hopper bucket—that's production! Just 34 seconds per bucket load!

Sand and gravel men must have this swift, efficient production to turn a fair profit. And it's this kind of production the Forrest Plant of the Holliday Sand and Gravel Co. gets day after day with their 1½ yard ERIE rehandler.

ERIE buckets are made for speed. This and the other fine ERIE features cause men like Superintendent Dewey Sloop to volunteer: "The ERIE is the best bucket we've ever had."

Check ERIE's features—then compare prices!

1. **SPEED:** Faster operation from short, powerful closing and opening action.
2. **DURABILITY:** Rigid, one-piece head shrugs off bumps and jars.
3. **LOW HEAD ROOM:** Permits higher stock piling—less frequent repositioning.
4. **LOW MAINTENANCE:** Continuous cable reeving with no reverse-S bends. Less cable to buy.

ERIE BUCKETS THE WORLD OVER

FOR CATALOGS, WRITE DEPT. E56

ERIE STRAYER CO.

956 GEIST ROAD • ERIE, PENNSYLVANIA

New Trade Literature

Subject: **Fruehauf Trailers**

Content: Fruehauf Trailer has prepared a four page brochure covering its line of trailers suitable for use by the construction industry. Outlined in the brochure are latest developments in dump trailers, carry-alls, bulk cement handlers, platform units, pole trailers and many other types. Each of these units is illustrated with a concise description of the unit and its purpose.

Where to get: Advertising Dept., Fruehauf Trailer Co., 10940 Harper Ave., Detroit 32, Mich.

Subject: **Two-Way Radios**

Content: A 10-page booklet entitled *Increased Profits for Concrete Producers through Complete Control of Ready Mixed Trucks with RCA 2-Way Radio* is now offered by the Radio Corporation of America. Through the use of actual case histories, the illustrated folder details the ways in which ready mixed producers are using RCA mobile radio to boost profits through greatly increased efficiency. It also describes RCA's nationwide service by factory-trained technicians. RCA also offers to have one of its communications specialists make a survey free of charge to any ready mixed producer interested in RCA mobile communications equipment.

Where to get: Radio Corp. of America, Camden 2, N. J.

Subject: **Portable Generator Plants**

Content: A new Master Vibrator four-page folder contains a check list to show construction men how to choose the correct portable power plant for every job. The chart which gives the amount of wattage needed to run various types of power tools is also featured. The illustrated folder also gives specifications of the new Master generators, as well as photos of them at work on representative jobs.

Where to get: Master Vibrator Co., 265 Stanley Ave., Dayton, Ohio.

Subject: **Garrett Customer Service**

Content: A new customer service publication titled *A Desk Guide to Garrett*, has been released by the Garrett Supply Div. of The Garrett Corp. The four-page publication contains a complete listing of all the lines Garrett carries. It shows what Garret Supply can do for any prospective customer who may need industrial supplies, or assistance in tooling or production problems. The firm is a major supplier of industrial tools.

Where to get: Garrett Supply Co., 9851 Sepulveda Blvd., Los Angeles 45, Calif.

Subject: **Blast Hole Drill**

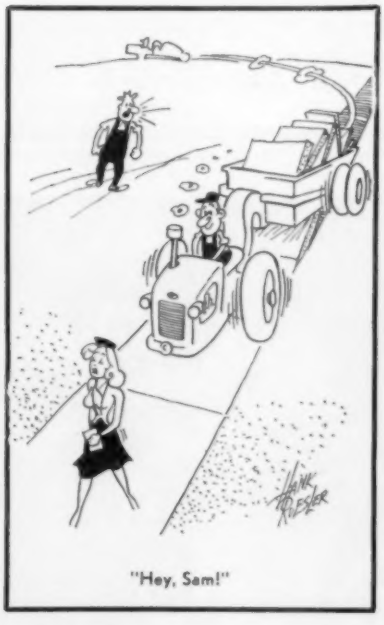
Content: Ingersoll-Rand presents its new Drillmaster 6½-in. blast hole drill in a 32-page bulletin well illustrated with job photographs. The bulletin gives details of the three types of mountings available—crawler, truck and tractor—and fully explains machine features. Two pages are devoted to helpful rock job estimating data. Ask for Bulletin 4179 on company letterhead.

Where to get: Ingersoll-Rand Co., Phillipsburg, N. J.

Subject: **Welding Process**

Content: A new 16-page *Picture Book of Facts on Eutectic's Welding Processes* provides information on Eutectic's low heat input metal-joining process. Technical data tells how Low Temp EutecRods and Low Amp Eu-

Continued on page 77



"Hey, Sam!"

SAFETY INSURED—When a 41,300-lb. section of stone crushing equipment was placed by an American 700 Series Crawler Crane, Crosby Clips were used on all wire ropes to assure maximum safety for men and equipment. Genuine drop-forged, hot-dip-galvanized Crosby Clips, with the famous Red-U-Bolt, are specified for safety on more jobs than any other drop-forged wire rope fasteners.

STRONG SAFE, BLOCK

When cofferdam sheetings were about to be drawn from the sucking, grasping soil of the Platte River bottom, a Load-Rated Crosby Crane Block was specified. Made of highest-quality steel, and engineered for safety as well as efficiency, Crosby Blocks are backed by the famous Crosby name—recognized leader in safety. When using Crosby Blocks, workmen can't go wrong, for the safe lifting capacity is embossed right on the side plates.

EASY TAKE-UP

Important design advances by the makers of famous Laughlin Turnbuckles offer added safety and efficiency to users in the construction field. Laughlin Turnbuckle bodies have extra-heavy hex ends which allow fast, easy take-up with a wrench. An exclusive eye design takes the ear of a shackle one size smaller and is stronger than conventional eyes because it conforms more closely to the lines of pull. This design also makes it easier to attach thimbles and other fittings. Exceptionally strong, Laughlin hooks have added heft at points of greatest stress—the ¼-inch hook is actually stronger than most ⅜-inch hooks. Available in a complete range of sizes. A reference chart in Laughlin's free catalog lets you select the proper size turnbuckle for each job.

ATTACH IN SECONDS

A more efficient clevis grab and slip hook made by Laughlin has a "Crimp Style", cotter that can be removed and attached in seconds. Available in a complete range of sizes at distributors everywhere, Laughlin Clevis Grab and Slip Hooks are made of drop-forged steel special forging quality and are heat-treated for maximum strength. For free catalog on the complete Laughlin and Crosby lines, write the Thomas Laughlin Division, Portland, Maine, or the American Hoist & Derrick Co., St. Paul 1, Minnesota.

Why Bucyrus-Erie QUALITY means Dependable Performance . . . Year after Year

Bucyrus-Erie has long stood for QUALITY in excavating equipment. Drawing upon 76 years of experience, its engineers have never relaxed their study of construction needs . . . their program of testing and research . . . or their policy of applying latest metallurgical and technical advances to the fully convertible power excavators and cranes they design.

Such careful study pays off in Bucyrus-Erie *Individual Design* where the right balance between power, weight, and speed delivers sustained high output at low cost *over a long period of time.* Each model — from ⅜- to 4-cu. yd. — is designed to handle its rated capacity with top efficiency year after year. There is no overdippering or underpowering simply to create "new" models. No parts are too big, none too small . . . and each is test-proved to assure highest quality.

Experienced users everywhere recognize the value of Bucyrus-Erie's close attention to quality in design, in materials, in manufacturing, and in service. They are convinced by top performance; long-life construction; simple, easy control; and on-the-job dependability. They know, too, that whatever equipment tomorrow's construction will demand — they can rely on Bucyrus-Erie to build it with the same *quality control.*

You can benefit, too. Learn how from your nearby Bucyrus-Erie distributor or write us direct.

210E56C

Gleason flame hardening applies long-life, wearing quality where it counts most on gears and pinions — extra hardness where drive teeth mesh.

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE
WISCONSIN

New Literature . . .

Continued from page 75

tecTrodes minimize residual stresses, cracking, warping and distortion of base metals. Several pages of the folder are devoted to case histories which tell how the process has brought savings in automotive, construction and machine shops.

Where to get: Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing 58, N. Y.

Subject: **Manganese Steel Sprockets**

Content: A four-page brochure describes and illustrates Taylor-Wharton's line of manganese-steel sprockets and points out the advantages of using TISCO sprockets with replaceable tooth segments. The use of self-hardening manganese steel is claimed to increase sprocket life up to 500% over cast-iron types. Replaceable tooth segments eliminate the need for removing an entire sprocket from the shaft when repairs are required. Ask for brochure No. 1-56.

Where to get: Taylor-Wharton Div., Harrisburg Steel Corp., High Bridge, New Jersey.

Subject: **Centrifugal Pumps and Valves**

Content: McNally Pittsburg has issued a new centrifugal pump and valve bulletin giving technical data on various sizes. The 20-page bulletin gives a complete description with photographs, dimension drawings, data tables and performance curves of McNally pumps. Also included is a complete description of the various types of valves in the line. Ask for bulletin 1055.

Where to get: McNally Pittsburg Mfg. Corp., Pittsburg, Kan.

Subject: **Caterpillar Equipment**

Content: Caterpillar has released four new pieces of attractively printed literature. *Something Special* is the title of a booklet dealing with the manufacture of fuel injection equipment. The booklet gives an insight into the practices used at the San Leandro (Calif.) plant which produces all Caterpillar fuel injection equipment, pointing out, as an example, that diamond dust is used for the final polishing. All topics in the eight-page booklet are supported by pictures of each particular operation. Ask for Form No. DE606. *Why Cat Diesels Are Best* is the title of the second booklet which explains seventeen of the most commonly asked questions about Cat engines. These cover economy, insurance rates, engine life, parts and service, ratings, turbochargers, availability for existing equipment and others. Ask for Form No. 31873. *When You Buy a Motor Grader* is the title of the third booklet which discusses operator convenience and operating costs of Cat motor graders. Written in an easy-to-read, non-technical language, the folder is intended as a guidebook for making an intelligent decision in choosing a motor grader. Ask for Form No. 31902. *Two New Engines* is the title of the fourth piece of literature which is prepared in broadside form. The broadside describes the 310-hp D337 (Series F) engine and the 200-hp D326 (Series F) engine. Caterpillar's recent engineering and research developments on the two models and various possible engine arrangements are detailed. Ask for Form No. 31914.

Where to get: Caterpillar Tractor Co., Peoria, Ill., or Caterpillar dealers.

Subject: **Precision Transits**

Content: A four-page bulletin describes Warren-Knight Series 2 and 4 precision transits. Design features, specifications and prices are listed.

Where to get: Dept. K, Warren-Knight Co., 136 N. 12th St., Philadelphia 7, Pa.

Subject: **Plastic Coated Wire Rope**

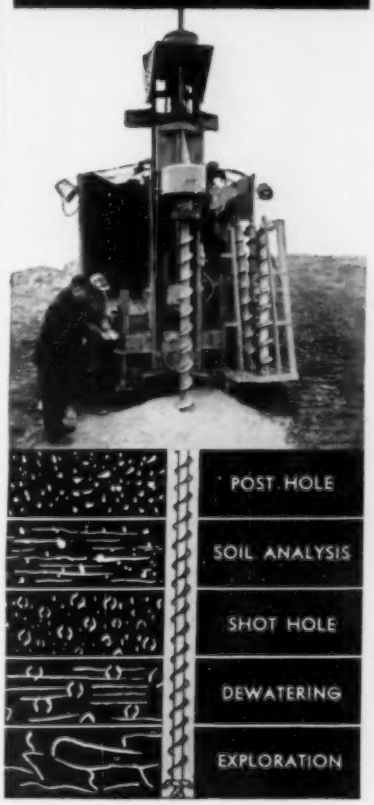
Content: New specifications and information regarding proper use of Macwhyte plastic coated wire rope are contained in a one-page circular. Ropes having strengths from 480 to 7,000 pounds, weighing from 13 to 153 pounds per 1,000 feet, are listed. Minimum safety factors, sheave and drum diameters, and tread pressure formulas are also included. Ask for circular No. 5610.

Where to get: Macwhyte Co., Kenosha, Wis.

Subject: **Construction Textbook**

Content: *Construction Planning, Equipment and Methods* is the title of a new book in the McGraw-Hill series in civil engineering. R. K. Peurifoy, professor of construction engineering at the Agricultural and Mechanical

DEEPER, FASTER
McCARTHY NEW HEAVY-DUTY
VERTICAL AUGER DRILLS



AUGER DIAMETER	DEPTH OF BORE
20" and 24"	16' to 30'
12" and 16"	60' to 70'

for drilling in earth, clay, compacted sand and gravel, and soft shale formations.

3", 4½", 6", 8" and 9" up to 125'

for drilling the above, plus drilling in hard sandstone formations.

Choose the most desired size auger for each drilling depth, in any vertical drilling operation. The new McCarthy Model 106-24 Vertical Auger Drill handles augers from 3" to 24" in diameter.

Adjust drilling speed properly for various rock and earth formations. Model 106-24 has two output shafts, one speed for earth and one for rock. A gear reducer slows auger rotation for harder rock formations. This gives more torque, or "biting power" in sand rock and soft limestone.

Write for Bulletin M-100

THE SALEM TOOL CO.
799 SOUTH ELLSWORTH AVE.
SALEM, OHIO, U. S. A.

College of Texas, is the author of the 534-page work. Some of the special topics covered include construction stages and construction layout; keeping records of equipment performance, material costs, and labor costs; selection of the most suitable types of earthmoving equipment; reducing the cost of excavating and transporting earth; the design of belt conveyor systems; selection of equipment for drilling rock or for producing crushed stone aggregate; a discussion of methods for reducing the cost of forms for concrete structures, with illustrative examples; and safety engineering as it applies to construction. Price is $8.50.

Where to get: McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y.

Subject: **High Strength Bolts**

Content: A 20-page illustrated booklet giving practical working information on high strength bolts is available from Russell, Burdsall & Ward Bolt and Nut Co. The booklet is designed as a working guide for ironworkers in the fast-growing technique of joining structural steel members. The theory of bolting is explained in simple terms, and technical findings helpful to bolting crews and other men on the job are summarized in easily understandable form through use of photos and line drawings. Sections of the booklet are devoted to identification of high strength bolts and proper sizes, comparisons with machine bolts, use of hardened washers, and good installation practices. Included is data on proper tightening, calibration of impact wrenches, air supply and inspection techniques. One section is devoted to types of structures and types of joints that are being bolted. Tables of recommended torques are also included. Ask for booklet HS-1.

Where to get: Russell, Burdsall & Ward Bolt and Nut Co., Port Chester, N. Y.

Subject: **Drott Skid-Shovels**

Content: Two new colorful folders, *Versatility Unlimited* and *Four-Machine Utility* provide information on the operating features of the new International Drott Four-In-One skid-shovels. These folders fully describe the mechanical features of the four-in-one, which is now available for International TD-6, TD-9, and TD-14 crawler tractors. Ask for forms CR-405-F and CR-406-F.

Where to get: Consumer Relations Dept., International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.

New Movies . . .

Subject: **Traffic Problems**

Content: Methods used by typical American communities to solve their auto safety, traffic and highway construction problems are portrayed in a 27-minute 16 mm sound movie. *Freedom of the American Road* shows how individuals and groups in communities across the country have worked together to build better roads, develop traffic-control methods and promote driver and pedestrian safety. It contains sequences on solution of traffic problems in San Francisco, Calif., Boston, Mass., and Pittsburgh, Pa.; on a highway improvement program in North Carolina; and on a traffic-safety campaign which won for St. Joseph, Mo., the nation's highest safety award.

Where to get: Film Library, Ford Motor Co., 16400 Michigan Ave., Dearborn, Mich.; 16 E. 52nd St., New York 22, N. Y., and 4303 Telegraph Ave., Oakland 9, Calif.

Subject: **Concrete Quality Control**

Content: This 30-minute color film shows how better, uniform quality concrete can be produced through improved control of water, air and rate of hardening. Entitled *The Man With The Trowel*, the film treats problems in meeting concrete requirements caused by variables in materials and conditions. Demonstrating the need for controlling these variables to obtain hour by hour uniformity of good concrete, it shows how Pozzolith is being employed to accomplish this result.

Where to get: The Master Builders Div., American Marietta Co., Cleveland 3, Ohio.

Subject: **Gradall Excavator**

Content: *Digging for Profits* is a 21-minute sound color film which explains functions of the Gradall excavator and shows the machine on a wide variety of applications in all parts of the nation. These applications include floodway projects, highway construction and maintenance, and general contracting jobs. The film shows the Gradall in operation on such jobs as digging ditches, laying pipe, hand grading, spreading of rip-rap rock on stream banks, shaping finished grades, and shaping ditches which will be lined with concrete. The machines shown in the film are owned by contractors, municipalities, county and state highway departments, and irrigation districts.

Where to get: Gradall Div., The Warner & Swasey Co., Cleveland 3, Ohio and Gradall distributors.

RENT INTERLOCKING STEEL SHEET PILING
"FASTER from FOSTER"
ALL LENGTHS & ALL SECTIONS TO MEET ALL YOUR JOB NEEDS
Foster's lower rental rates on all standard piling sections give you a low fixed expense as an added competitive advantage when bidding on jobs. RENT: Light-weight Corrugated Steel Sheet Piling—Pile Hammers and Extractors.
Send for: Piling Chart EE-5.
L.B. FOSTER CO.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
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STANDS UP TO SEVERE USE

and even abuse

One word describes a Hayward — *ruggedness.* Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888

Notes from the Manufacturers

Atlas Copco Eastern, Inc., Paterson, N. J. has appointed Dan J. Goodwin northeast district manager for the pneumatic equipment firm. Goodwin will supervise sales and service in the New England states, New York, New Jersey, Pennsylvania and West Virginia. A graduate of the Provincial Institute of Mining at Haileybury, Ont., he joined Atlas Copco Eastern in September, 1954. Prior to that he served as mine captain and mining engineer in silver, cobalt, uranium and base metal mines in Ontario and the Yukon Territory. He is a member of the Canadian Institute of Mining and Metallurgy.

Baldwin-Lima-Hamilton Corp., Construction Equipment Div., Lima, Ohio, has appointed three new distributors to handle its line of Lima shovels, cranes, draglines and pull shovels. They are: Mineco, Inc., Box 822, Bartow, Fla., for the central portion of Florida; Southern Equipment Sales, Inc., 980 S. State St., P. O. Box 1787, Jackson 5, Miss., for the southern half of Mississippi; and Hall-Perry Machinery Co., Butte, Billings and Great Falls, Mont., for the entire state of Montana with the exception of Lincoln, Mineral and Sanders counties.

Borg-Warner Corp., Chicago, Ill., has elected Stephen L. Ingersoll president and general manager of its Ingersoll Steel Div. Ingersoll began with the division in 1920 and has served as a vice president since 1930. He succeeds H. G. Ingersoll, who is retiring from the presidency of the division after five years in that post. H. G. Ingersoll will continue as a

Cleveland® "95" digs 10 miles for airfield lighting system at Portsmouth, N. H. Air Force Base

Morrison-Knudsen Company, Inc. and Landers & Griffin, Inc. employed a Cleveland Model 95 "Baby Digger" to good advantage in the construction of the airfield lighting system for the Strategic Air Command's 4,500-acre, $60,000,000 Jet Base at Portsmouth, N. H. The Cleveland dug approximately 52,000 feet of trench 17 inches wide by 27 inches deep for the installation of cable and duct.

The "Baby Digger" was also profitably used on the same project for the excavation of some 3,600 feet of underdrain pipe trench, approximately 2 feet wide by 5 feet deep. As the photograph above shows, much of this trenching was done in rocky, stony soil, definitely not what could be termed "easy going."

The dependable Cleveland steadily delivered good daily trench footage—as it had been counted upon to do—in spite of the rugged digging and adverse conditions encountered. Just another example of Cleveland's ability to *dig more trench . . . in more places . . . at less cost.*

Talk it over with your Cleveland distributor

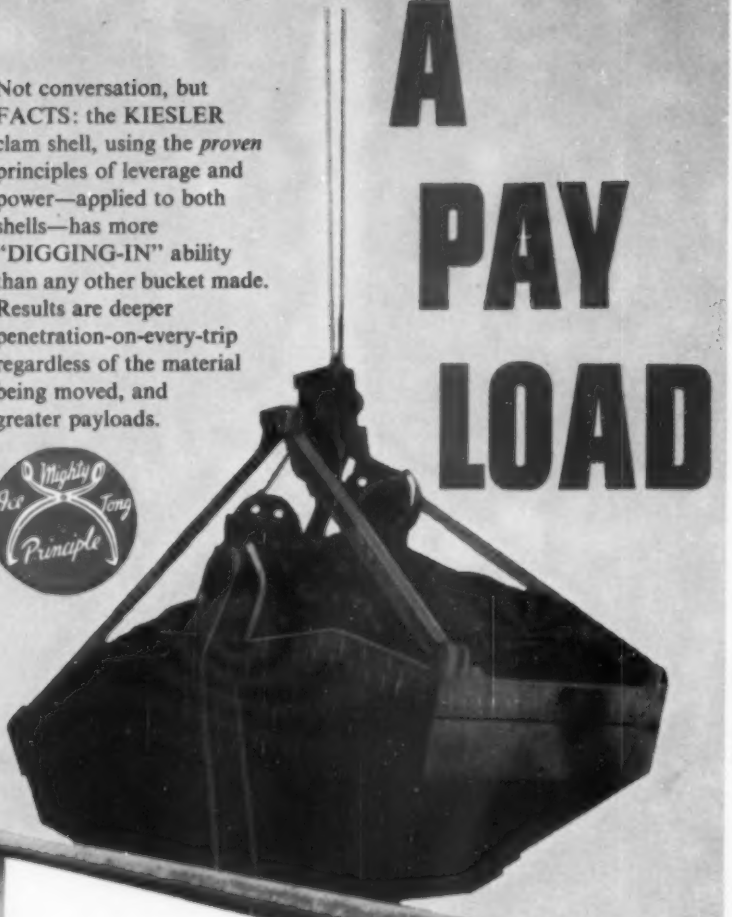
THE CLEVELAND TRENCHER COMPANY • 20100 St. Clair Ave., Cleveland 17, Ohio

CLEVELAND

EVERY LOAD A PAY LOAD

Not conversation, but FACTS: the KIESLER clam shell, using the *proven* principles of leverage and power—applied to both shells—has more "DIGGING-IN" ability than any other bucket made. Results are deeper penetration-on-every-trip regardless of the material being moved, and greater payloads.

Kiesler Mighty Tong Principle



PROMPT SERVICE AVAILABLE

Factory service on Kiesler Buckets and as an accomodation on other makes, too. Whatever the problem, feel free to call on us.

GUARANTEE

Kiesler Buckets are guaranteed to outperform and do a bigger day's work than any other Bucket of equal weight, width and size, when properly reeved and operated.

JOS. F. KIESLER CO.

KIESLER Since 1892

944 W. HURON ST. • CHICAGO 22, ILL. • MONROE 6-7144

vice president and director of the parent Borg-Warner Corp.

Caterpillar Tractor Co., Peoria, Ill., has scheduled a five-day open house May 21-25 for its new wheel tractor and motor grader manufacturing plant at Decatur, Ill. The new plant was built to free Caterpillar's facilities at Peoria, Ill., for full production of diesel engines and crawler tractors. It is the fifth new plant in the company's postwar expansion. Construction of the Decatur plant was started in 1954. The first motor grader rolled off its assembly lines in June, 1955, and the first wheel tractor in October. Open house visitors will see the plant in full-scale production. Caterpillar domestic manufacturing facilities are now located in Decatur, Joliet and Peoria, Ill.; York, Pa., and San Leandro, Calif. Trackson Co., a wholly-owned subsidiary of Caterpillar, is located in Milwaukee, Wis. Caterpillar also has subsidiaries in Australia, Brazil and Scotland.

Gardner-Denver Co., Quincy, Ill., has announced two sales appointments. William B. Knoderer is sales manager of the firm's industrial division, and Niel Martin Fishback is sales manager of the mining and contracting division. Knoderer was sales manager of Keller Tool Co., Grand Haven, Mich., before it was merged with Gardner-Denver., and had served with Keller Tool since 1947. He is an electrical engineering graduate of Union College. Fishback joined Gardner-Denver in 1948, and served as district manager, El Paso (Tex.) branch, until his recent appointment.

The Garrett Corp. of Los Angeles, Calif., has announced that its subsidiary, the Garrett Supply Co., has been appointed an authorized distributor for General Electric motors and control equipment. The G-E line of motors includes fractional and integral horsepower units for single phase, polyphase, or direct current in open drip-proof, totally-enclosed, and explosion-proof construction. G-E control equipment includes manual and magnetic motor starters, contractors and relays, push-buttons and other control accessories for automatic operation. These devices are also available in open, enclosed, and explosion-

Continued on page 82

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

SHOVELS DRAGLINES DRILLS TRACTORS TRUCKS

190-B Bucyrus-Erie elec. 8 yd. shovel
170-B Bucyrus-Erie elec. 6½ yd. shovel
1600 P&H 6 yd. electric shovel
2400 Lima 6 yd. diesel shovel
120-B Bucyrus-Erie elec. 5 yd. shovel
111-M Marion 3½ yd. diesel shovel
955 P&H 2½ yd. diesel shovel
7400 Marion elec. drag 200′ boom, 8 yd.
625 Page diesel dragline 160′ boom, 9½ yd.
2400 Lima diesel dragline 130′, 5 yd.
4500 Manitowoc diesel dragline 120′ boom, 5 yd.
1055 P&H diesel dragline 80′ boom, 4 yd.
3500 Manitowoc diesel dragline 85′ boom, 2½ yd. bucket
3500 Manitowoc erection crane, 120′ boom, 20′ jib—air control
802 Lima 50-ton erection crane and dragline, 70′ boom, 18′ jib
2—TC Wooldridge 15 yd. Terra Cobras
600 Reich heavy truck mounted rotary drill
Quarrymaster drill with 2—500 cu. ft. compressors
58-BH Joy Champion Rotary Air Drill
56-BH Joy Middleweight Rotary Air Drill
Also 42-T, 29-T, and 27-T Well Drills
Euclid Trucks—Many to Choose From

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

Stripping front end only for 54-B shovel. THE W. T. WALSH EQUIPMENT CO., 12750 Berea Rd., Cleveland 11, Ohio. Phone Academy 1-1600.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie 54-B 2½ yd. standard shovel front only, complete including deck machinery and bucket; excellent condition; Price $5,000; dealers protected. J. P. MacFarlane, 605 Mellon Bank Bldg., Butler, Pa., Phone 74033.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie 15-B dragline crane with standard boom and 5′ extension, Buda engine, ½ yd. Bucyrus-Erie dragline bucket. F.O.B. Greensboro, N. C. $5000

Insley ½ yd. machine with shovel front, Serial K-3684, F.O.B. Greensboro, N. C. $4500

Koehring Model 205 combination crane, backhoe and shovel, with International diesel engine, Serial C-5082, F.O.B. Greensboro, N. C. $5000

Rex Model 34-E dual drum paver with hydrocycle control, standard water storage tank, distributing boom, controlled door bucket, with 10′ clearance at end of boom and powered by General Motors diesel engine. This machine was new in 1952.

E. F. CRAVEN COMPANY
Greensboro, N.C.

Bucyrus-Erie GA-2 with 1¼ yd. shovel front, 50′ crane boom, DBL. drums, chain drive cats. Bucyrus-Erie GA-2 with 1 yd. shovel front, chain drive cats. Koehring single drum 27E paver. Foote single drum 34E paver with gasoline engine. Foote single drum 34E paver with GM diesel engine. C. H. & E. 6-cylinder gas triplex high pressure water pump. All of this equipment located at Royal Oak, Mich. OAK CONSTRUCTION CO., 220 E. 7th St., Royal Oak, Mich. Phone LIncoln 1-1278.

Bucyrus-Erie Model 32-B crane, shovel and dragline; 55′ boom, 1 yd. capacity, S/N 11345; equipped with UD-18A International diesel engine; machine in good condition.

C. H. ATKINSON PAVING CO.
King Hill Building
St. Joseph, Mo. Phone 2-6982

USED EQUIPMENT

3—"C" Tournapulls with E-16 scrapers.
1—"C" Tournapull with E-15 scraper.
1—C-11 Tournapull with E-16 scraper.
1—Super "C" Tournadozer.
3—E-16 Tournarocker bodies.
2—E-9 Tournarocker bodies, less wheels.
1—C-16 Michigan backhoe on crawlers.
1—P&H ¾ yd. crane with 35′ boom on crawlers.
1—25 Northwest ¾ yd. crane with 30′ boom on crawlers.
1—P&H 1 yd. crane with 50′ boom on crawlers.
1—75-B Lorain 1 yd. diesel powered backhoe.
1—77 Lorain 1½ yd. diesel powered shovel.
1—855 P&H with 80′ boom and 2 yd. dragline bucket.
1—New 375-BC American diesel shovel on crawlers.

Write or Wire for Our Complete Used Equipment List

FURNIVAL MACHINERY CO.
Lancaster Ave. at 54th Street
Philadelphia 31, Pennsylvania
Phone: TRinity 7-5200

MISCELLANEOUS EQUIPMENT

Bucyrus-Erie Model 22-B, ¾ yd. shovel, with Caterpillar D-318 Diesel engine. Good condition. Can be seen at Waite yard.

Gradall—Model 2460, mounted on K-8 International truck chassis. 36″ digging bucket. Very good condition; repacked and repainted. Waite yard.

Quickway—Model E Clamshell—Dragline Combination, mounted on Oshkosh 4-wheel drive truck carrier. Both truck and upper assembly overhauled less than 200 hours ago. Priced right. Located in Milwaukee; call for appointment to inspect.

Quickway—Model J back hoe—Shovel Combination. Very good condition. Priced to sell. Waite yard.

Michigan T-6-D rubber mounted shovel. Good condition. Priced right. Waite yard.

H-3 Hydrocrane, mounted on L-162 International truck chassis—equipped with operator's cab, hydraulic tagline reel, clamshell. Very good condition. Waite yard.

H-2 Hydrocrane with clamshell bucket, tagline reel; as is, or rebuilt. Priced right. Waite yard.

Insley—Model 12, ¾ yd. back hoe; good condition; call for appointment to inspect.

Caterpillar D-6 Bulldozer, Diesel power, narrow gauge; excellent condition; priced to sell quick. Call for appointment to inspect.

Caterpillar D-4 Bulldozer, wide gauge hydraulic blade, new street plates, current series model; perfect condition; priced right. Call for appointment to inspect.

Parson Trench Machine Model 25, equipped with full crawlers, Waukesha engine; perfect water pipe machine; excellent condition; approximately ¼ of today's cost. Call for appointment to inspect.

Paige RC Automatic Dragline Bucket, 1¼ yd. capacity; very good condition; priced for quick sale.

J. P. WAITE CONSTRUCTION CO.
3308 West Pierce St. Milwaukee 15, Wis.
Phone EVergreen 4-1900.

BUCYRUS-ERIE 38-B 1½ YD. SHOVEL FRONT
Shovel front in operating condition.
Price
$3,000.00
Wire or phone CYpress 2-4800

H. O. PENN MACHINERY CO., INC.
140th Street & East River
Bronx 54, New York

Johnson concrete batching, mixing plant.
Locomotives, diesel, gas, 15 to 100 tons.
Bucyrus 54-B, 120-B, Marion 111-M, 93-M.
S/L derricks, steel, 10, 20, 35, 75 tons.
Euclid trucks, 22-ton rear dump (2).
Colby elec. hammerhead crane, 14-ton.
Rotary kilns, dryers, 7x110, 6x74, etc.
Shovels, cranes, draglines, 1½ to 18 yds.
Monighan walking draglines, 9-W, 6-W, 4-W, 200-W.
Placer gold dredges, 4½′, 6′, 12′, 16′.

H. Y. SMITH COMPANY
828 N. Broadway Milwaukee 2, Wis.

MISCELLANEOUS EQUIPMENT

3—10" McCulley gyratory crushers.
3—Traylor No. 412 type TZ gyratory crushers.
2—Traylor 8" gyratory crushers.
1—New RCA metal detector 10"x36" aperture.
6—Used single deck Robins gyrex screens with bases.
5—Used single deck Robins vibrex screens.
1—Used Cameron pump, size 10", 2400 GPM, 125" head, 1150 RPM, left hand, serial no. 57537.
1—Used Cameron pump, size 10", 2400 GPM, 125" head, 1150 RPM, right hand, serial no. 57535.
1—New Edison voice writer (dictaphone).
1—Marion model 490, serial no. 6201, Ward Leonard Control; also spare parts. In addition, we have a substation 2300/440 volt with three 150 KVA transformers.
1—20" Traylor heavy duty finishing crusher.
4—Allis-Chalmers Gates "D" crushers, size 6.
1—Traylor rolls crushers—30"x72".
*1—Fuller Kinyon system.
*1—Allis-Chalmers compeb mill.
*2—Dryers for use with above mill.
1—Gill horizontal bit dresser.
1—1-ton Cummer black top plant.
*1—Covered steel barge, suitable for carrying cement.
*1—Covered wooden barge, suitable for carrying cement.
1—Thew Lorain 60 shovel.

*Available after January 1, 1957.

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Notes . . .

Continued from page 80

proof construction, and for standard, reversing, multi-speed operation; also in combination forms with fused switches or circuit breakers.

The General Tire & Rubber Co., Akron, Ohio, has promoted William C. Weirath to assistant manager of commercial sales. In his new post, Weirath will assist Karl A. Dalsky, commercial sales manager, in directing the sales of truck and other commercially used tires. Formerly manager of Kraft sales and service, he has contributed much to the development of the Kraft system of retreading and recapping, according to the firm. Beginning with the company as a Kraft engineer, he was promoted to manager of the department in 1953.

Marion Power Shovel Co., Marion, Ohio, has transferred several of its sales representatives. Walter Pierson, formerly southeastern area sales manager, has been transferred to the Marion home office to assume the duties of assistant to L. C. Mosley, manager of the company's mining division. Pierson has been with Marion for five years in various sales capacities. Hugh Lewis replaces Pierson as southeastern area sales manager. Lewis' headquarters will be at Marion's new district office and warehouse in Atlanta, Ga. Previously, he was a divisional sales manager at Dallas, Tex., for three years. William Garrison, divisional sales manager, will assist Lewis. He was transferred from a similar position which he had held in the company's area sales office at New York City.

Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc., Sunnyvale, Calif., has named E. H. Kliebenstein Co., Ridgefield, N. J., as a distributor of the CCS Wooldridge scraper line in northern New Jersey and southeastern New York. CCS Wooldridge scrapers range from 7½ to 41-yd. capacities and include both self-propelled and tractor-drawn types. The Kliebenstein organization is headed by E. H. Kliebenstein, president; W. W. Layng, sales manager; Ralph Maucione, service manager; and M. J. Halloran, parts manager.

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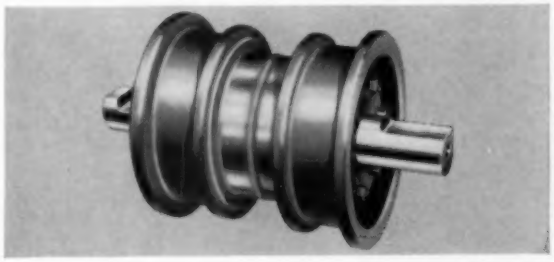

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